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PYLORIC STENOSIS IN INFANTS

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DURING the past few years the attention of the surgical staff of the Hospital for Sick Children has been called to a condition of obstruction at the pyloric opening of the stomach, occurring in infants, which had hitherto passed unrecognized, or if recognized had been treated with more or less success by purely medical measures.

From a review of the literature and from our own experience it is evident that if this condition is untreated the mortality is nearly 100 per cent. Under medical treatment, which consists of proper feeding and frequent gastric lavage, a certain percentage slowly recover. According to the records of some observers, of whom Robert Hutchison is one, this has been as high as 64 per cent; according to others, as low as 40 per cent. We are informed by the physicians in charge of pædiatrics at the Children's Hospital that the percentage of recoveries in their clinic and in private practice is somewhere between these rather wide extremes. It is not the intention of this paper to discuss the medical treatment of the condition except insofar as it affects the surgical treatment. Attention will be drawn to the advisability of attempting the cure of these patients first by medical measures, but it must be pointed out that this form of treatment is very tedious and sufficiently doubtful to require the sharpest attention of the physician, to see that the patient does not slip past the mark, beyond which no form of treatment can save him. These patients have a habit of remaining in a stationary condition for days or weeks and then suddenly succumbing to

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inanition. We have therefore come to recognize that if these patients do not show a prompt response to medical treatment, some radical measure must be adopted if an enormous mortality rate is to be prevented. But if any degree of success is to be obtained from surgical treatment, it is imperative that the operation be performed before the starvation of the patient makes such a surgical operation dangerous.

The symptoms of pyloric stenosis in infants are very uniform and clear cut. The condition occurs, in the majority of instances, in healthy nursing babies. All goes well for a week or two and then vomiting after feeding suddenly begins, rapidly becoming worse and developing a projectile character. Bowel movements become less and less frequent, until absolute constipation is established. The weight rapidly falls. Examination of the abdomen shows distension of the stomach with visible peristalsis passing from left to right. Palpation slightly to the right of the middle line above the umbilicus usually discovers a hard round tumour about the size of an acorn, freely movable, which can be demonstrated to be the hypertrophied pylorus. The vomiting sometimes comes on gradually, developing from a simple regurgitation, but in the majority of cases it begins suddenly and assumes its projectile character at once. It may occur in the midst of or immediately following feeding, the whole of the feeding being expelled for a distance of several feet. Sometimes a greater quantity is vomited than was taken at the last feeding indicating abnormal retention of food in the stomach. If the condition is unrelieved the vomiting increases in frequency until it occurs with every feeding and no food whatever reaches the infant's intestine.

Coincident with the onset of vomiting, constipation develops, at first as a reduction of the frequency of the stool and then as a reduction in its size. Gradually all fœcal material disappears and several cases have been admitted in which no bowel movement had occurred for nearly a week. Similarly there is a reduction in the outflow of urine, and cases are on record in which an incorrect diagnosis of acute nephritis with suppresson had been made owing to the cessation of urinary outflow.

Naturally the weight falls, the loss being directly proportionate to the severity of the vomiting. Several of our cases had reached a marked degree of emaciation before admission, making any form of treatment a forlorn hope.

To establish a diagnosis is quite simple in many instances. The physical examination shows the abdomen soft and not distended, thus excluding peritoneal inflammation and intestinal obstruction of any form. There may be considerable distension of the stomach but the most noticeable feature in relation to the stomach is the presence of visible peristalsis. This may be spontaneous or may be produced by flicking the abdominal wall or giving a small quantity of food. The waves are large, two or three inches long, extending vertically across the stomach and passing rapidly from left to right. Often a second wave is commencing before the first has reached the region of the pylorus. Visible peristalsis of the stomach may be taken as pathognomonic of pyloric obstruction.

The presence of a tumour is very constant although there may be some difficulty in locating it. Sometimes it can be felt immediately and at other times ten or fifteen minutes may be spent before it can be found. This is readily explained by the findings at operation, the tumour sometimes being hidden in the angle between the bodies of the vertebra and their transverse processes. A good method of locating it consists in standing on the left side of the patient and palpating deeply in the upper part of the abdomen slightly to the right of the middle line and above the umbilicus. The whole of this area should be explored, pressing deeply against the posterior abdominal wall and moving the abdominal contents freely about so as to change the position of the tumour and make it easier of detection. In all of our cases but one it was possible to demonstrate the presence of a tumour.

In corroboration of the diagnosis, it is frequent practice to attempt the passage of a duodenal catheter. In normal infants it is possible to pass a 17 mm. catheter through the pylorus in from ten to fifteen minutes. If any but the mildest degree of spasm or stenosis of the pylorus exists the duodenal catheter cannot be passed.

Before attempting to treat such patients it is necessary to understand something of the nature of the condition present. At autopsy and at operation we have found from slight to moderate dilatation of the stomach with hypertrophy of its walls. (See Fig. 1.) Surrounding the pyloric orifice is situated a smooth round swelling varying in size from that of a small to that of a large hazel nut. It is decidedly white in colour, in marked contrast to the neighbouring stomach and duodenum. The degree of whiteness varies with the density and size of the tumour. In some cases the tumour is quite as hard as cartilage, while in others it is more of the consistency of uterine muscle. If an incision be made into the tumour in the living subject, it will be found to resemble quite closely fibro-cartilage in consistency, colour, and in the fact that there is practically no bleeding. Dissection of the specimen at autopsy shows the tumour to consist of the enormously hypertrophied muscle wall of the pylorus including both circular and longitudinal fibres. (See Fig. 2.) This hypertrophy has resulted in a stenosis of the pyloric outlet of the stomach to such a degree as to prevent the passage of food. Even on the operating table it is impossible to force gas past the obstruction, and at autopsy the ordinary catheters cannot be passed into the duodenum. The stenosis is due entirely to the hypertrophied muscle, no diminution in the size of the tube of mucous-membrane being present, as can be demonstrated in transverse sections and by removing the muscular coat. The hypertrophied muscle varies from three-sixteenths to three-eighths of an inch in thickness. Sections of the tumour show the swelling to be due both to increase in the size and the number of the muscle fibres.

The question of the causation of such a pathological condition is as yet enshrouded in mystery. There is nothing in the development of the viscera to account for it and yet it is certain that the condition is present before birth, as such a degree of hypertrophy could not occur in the two or three weeks during which food has been entering the stomach. Some have thought that the condition arises in a state of spasm of the pyloric sphincter, the mild cases being the result of spasm alone, and the severe cases, due to a superadded hypertrophy with stenosis, but of this we have no knowledge as all the cases we have seen both at autopsy and at operation have been typical cases of hypertrophic stenosis. It is a noteworthy fact, however, that symptoms rarely appear before the third week of life so that it seems likely that obstruction which is severe enough to produce symptoms is the result of a combination of congenital hypertrophy and of spasm.

With the establishment of a diagnosis the rational indication for treatment is the relief of the obstruction. Whether the treatment shall be surgical or not depends entirely on the completeness of the closure of the pyloric outlet. If the patient is rapidly losing ground with vomiting of all its food, absolute constipation and suppression of urine, the indication is for immediate operation, as no other form of treatment can possibly save the patient. If on the other hand the symptoms are not so severe it is wise to study more accurately the degree of obstruction produced and to try to relieve any pyloric spasm which may be present by gastric lavage. When such a patient is admitted to the wards it is the practice of the physicians to make an accurate record of the weight and to watch the reaction of the stomach towards food. A measured quantity of breast milk is fed to the patient and after the lapse of the time ordinarily required for the emptying of the stomach the contents of the stomach are aspirated and measured. In mild cases the amount retained in the stomach is small and the prospect of the relief of the condition by medical treatment is good. Under regular gastric lavage the retention may steadily diminish and the symptoms correspondingly improve. If on the other hand the retention shows a daily increase with exaggeration of the symptoms, recourse must be had to immediate surgical intervention. When the frailty of the thread which connects these infants with life is remembered, the futility of dallying over ineffective therapeutic measures must be appreciated. The only way of saving such patients is to get a regular supply of food past the stomach and the only way of accomplishing this is by operation.

Until recent years the operative treatment of pyloric stenosis has consisted of an ordinary posterior gastro-enterostomy. Several writers have reported good results from this operation but we have had no personal experience with it. It would appear to be a dangerous procedure, however, as it is nearly impossible to do a complete gastro-intestinal suture in less than forty-five minutes, and one must remember that these patients are very ill and usually less than a month old. The operation which we have employed in these cases is known as the Webber-Rammstedt method. The abdomen is opened by a small incision through the right rectus above the umbilicus. The tumour is discovered and delivered over the abdominal wall and the appearance, thickness and density noted. By squeezing on the air in the stomach the degree of stenosis can be demonstrated. On the surface of the white tumour can be seen the small blood vessels passing on both sides of the pylorus from below upward. Fortunately, along the upper border there is a space about an eighth of an inch wide which is practically bloodless and this area is used for the incision. The tumour is held firmly between the thumb and forefinger of the left hand and an incision is made into the tumour in the line of the axis of the gut, extending the full length of the swelling. This incision is carefully deepened until the mucous membrane begins to bulge into it. The external surface of the mucous membrane is then exposed throughout its whole length. The muscle is so hard that when the incision has been completed very little retraction takes place so that something more is necessary to make sure that the stenosis is relieved. With the points of a Mayo scissors or with dissecting forceps, the muscle is gently separated from the mucous membrane and the incision stretched open so that the mucous membrane is exposed for a width of an eighth of an inch or more. It will then be seen to be of large lumen and to bulge freely into the incision. That the stenosis has been relieved can be demonstrated by squeezing air through the pylorus from the stomach or by passing a stomach tube into the duodenum. Fortunately there is practically never any bleeding in the intestinal wall but if any small vessels have been cut they must be tied. The viscera are then returned to the abdominal cavity without further manipulation and the abdomen closed. During the operation the patient is kept surrounded with hot water bottles and the limbs are wrapped in non-absorbent cotton. As little manipulation of viscera as possible is employed and the time of the operation is reduced to a minimum, usually from fifteen to twenty minutes. With these precautious it is remarkable how little surgical shock is present.

The post-operative treatment is of the utmost importance and in all except the purely surgical details is directed by the staff in pædiatrics. Briefly the measures employed are as follows:—

1. Hypodermoclysis immediately following operation, of normal saline and 4 per cent. glucose solution. From 100 c.c. to 200 c.c. is employed. This may be repeated during the next few days.

2. Stimulation in the form of the hypodermic injection of adrenalin in 5 minim doses.

3. Measures to keep up the temperature of the patient to normal such as the use of hot water bottles and a special coat made of cotton sometimes used for premature babies.

4. Attention to the position of the patient. Until the effects of the anæsthetic have passed off the child's head is lowered, after which the position is changed to the semi-upright, to facilitate the emptying of the stomach and the eructation of gas.

5. Careful feeding. As soon as the effects of the anæsthetic have passed off, usually an hour after the operation, a few drachms of water are given and an hour later a mixture of three drachms of the mother's milk and a drachm of water. This is repeated at regular three hour intervals. Of the feeding of the infant nothing further will be said except that if at all possible, breast milk should be provided and the normal nursing of the child interrupted by

not longer than a week or ten days. Careful feeding is absolutely imperative, as digestive upsets are very apt to lead to fatal results.

Following operation the successful cases run quite a typical course. The feedings are taken readily and are retained, although during the first few days occasional vomiting may occur. This vomiting is usually of the regurgitant type, rarely explosive. Projectile vomiting after operation is usually suggestive of incompleteness in the relief of the obstruction. With the administration of fluid subcutaneously and by mouth the excretion of urine returns to normal and in a day or two fœcal material begins to appear in the stool. In a week or so normal bowel movements have been reëstablished although a considerable diarrhœa is a frequent sequel. After an initial loss of weight extending over two or three days, the weight begins to rise and if no setbacks occur, the rise is continuous. After the lapse of two or three months, these patients cannot be distinguished from normal children.

Outside of the purely medical complications which involve these patients, several surgical contigencies have to be considered. Fortunately shock is rare but if present is combatted as described. Hæmorrhage must be guarded against most carefully. One of our patients died on the day following operation and at autopsy a great quantity of blood was found in the peritoneal cavity which had come from a small bleeder in the pyloric incision. Before dropping the viscera back into the abdomen we are now careful to see that all hæmorrhage has ceased and the intestine is allowed to rest in the abdominal incision for five minutes or more without any constriction of the blood vessels of the mesentery or omentum if there is any suspicion of oozing. There is the usual danger from infection of the abdominal wound which is relatively more serious in these emaciated infants. In relation to the technique of the operation itself, one point is essential, that the constriction shall be completely relieved. In one of our patients who died a few days after the operation, without relief of the symptoms, autopsy showed that the incision had not been sufficiently long to divide all the constricting muscle nor had the muscle been stripped back enough to allow bulging of the mucosa. This point is now scrupulously attended to. With greater experience in handling these cases we now feel that the mortality can still be considerably lowered by the elimination of these surgical complications.

During the past two years sixteen cases of undoubted pyloric stenosis have been treated surgically in the Hospital for Sick Children. Of these sixteen cases, eleven recovered, a morality of

31·2 per cent. Of the five fatal cases, one died of hæmorrhage; one died sixty hours after operation with no relief of the symptoms because of incomplete operation; a third case which died three days after operation was a very desperate case on admission, there having been absolute constipation for five days and vomiting of all the food. This patient ceased vomiting after the operation but had evidently passed the possibility of recovery before operation; the fourth case was a prostrated premature baby which had practically no chance from the beginning. It died about twelve hours after operation. Autopsy showed hypostatic congestion of the lungs, nephritis and colitis. The fifth died three days after operation in spite of the relief of vomiting, of general weakness.

Of the eleven cases which recovered, two died subsequently, of other conditions, and autopsies were obtained. The first died six weeks after the operation, of acute entero-colitis. All the symptoms of pyloric stenosis were relieved by the operation and the case was a favourable one for complete recovery until the intestinal infection developed. This case is of particular interest because at the operation a small section of the muscle was removed for microscopical examination and it is now possible to compare this with the sections made at autopsy more than a month later. It will be observed that the relief of the obstruction has made no difference in the appearance of the muscle fibres, which are greatly increased in size and in number in both. Comparing the cross section of the pylorus made at autopsy with a normal at the same age it will be observed that the muscular coat is five or six times the normal thickness. (See Fig. 3.) It would also appear that there is a corresponding increase in the size of the lumen of the pylorus. The section also shows clearly what happens as a result of the incision through the muscle. In the gross the peritoneum was fully healed over the incision and no evidence of the incision was to be seen. The histological specimen shows that after the operation the peritoneal edges of the incision opened out widely and that the peritoneum grew over the edges and down into the incision to meet on the exposed mucosa. Separating the lumen of the bowel from the peritoneal cavity at this point is the mucous membrane, the submucous areolar tissue, the muscularis mucosæ which evidently escaped the scalpel, a small quantity of white fibrous tissue and the peritoneum. Whether this permanent weakening of the wall of the intestine will have any late effects, time alone will tell. (See Fig. 4.)

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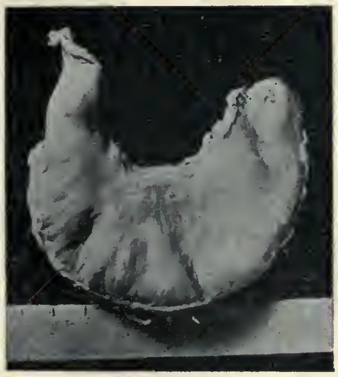

Fig. 1.—Autopsy specimen from a case of pyloric stenosis. It shows moderate dilatation and hypertrophy of the stomach and the typical tumour at the pylorus.

Fig. 2.—Section through the wall of the tumour showing the junction of the circular and longitudinal muscles. It demonstrates that the tumour is the result of true hypertrophy of the muscle.

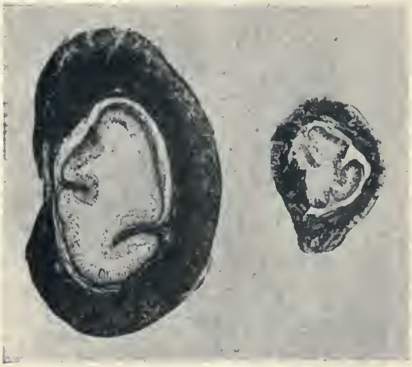

FIG. 3—The figure to the left is a photograph of a section of a pylorus upon which a Webber operation had been performed six weeks previously. It shows the persistent thickening of the walls and a dilatation of the lumen. On the left side of the figure can be seen the healed incision through the muscles. The figure to the right represents a normal pylorus from a child of about the same age.

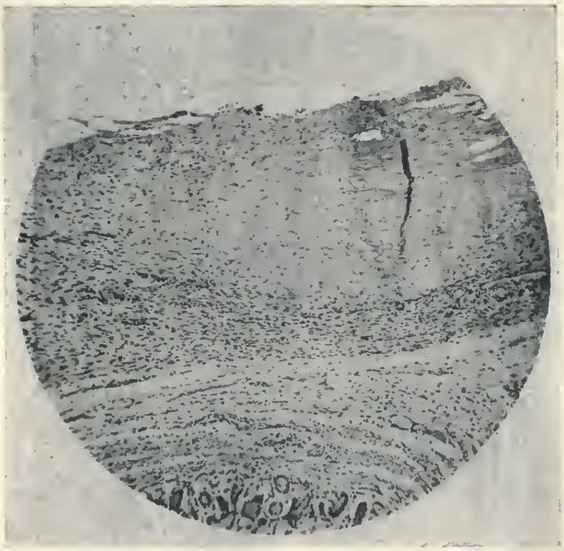

FIG. 4.—A section through the wall of the pylorus at the bottom of the healed Webber incision shown in Fig. No. 3. From below upward it shows, mucous membrane, muscularis mucosæ, fibrous tissue and peritoneum. The wall is very thin at this point.

The second case died of pneumonia and empyæma about a year after the operation. The relief of the pyloric obstruction had been complete and recovery perfect. At fourteen months of age he appeared to be a normal baby. At autopsy the pyloric enlargement was found to persist although the ratio of its size to that of the neighbouring intestine was slightly smaller. It is evident therefore that the pathological condition present is not one suddenly developed or easily changed.

The remaining nine patients are alive and well, apparently suffering no ill effect from their pathological condition or from the operation.

In conclusion, we wish to add our testimony in favour of the operative treatment of pyloric stenosis. While admitting that many of these cases, in which the hypertrophy of the muscle is slight and the obstruction mostly due to spasm, can be relieved by medical treatment, a warning must be issued against persisting in this treatment if prompt improvement does not occur. Many cases treated in this way have undoubtedly died which might have been saved by operative relief of the obstruction. A further warning must be sounded against delaying operation until the patient is so weakened by starvation that he is no longer a safe subject for an abdominal operation.

The writers are much indebted to Dr. C. L. Starr for the opportunity to study the cases admitted to the public wards of the Children's Hospital and for permission to include in this report the cases operated on by him.

TUBERCULOSIS OFTEN OF SECONDARY IMPORTANCE TO OTHER PATHOLOGICAL CONDITIONS

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OUR present conception of tuberculosis is that there has been tuberculous implantation existing for many years in most people and that clinical tuberculosis is the result of lowered resistance to the infection. Tuberculosis is a physical incubus which must be reckoned with as possible in everyone, and, likewise, the tuberculous patient is subject to other ills. The development of pulmonary tuberculosis is often influenced by the presence of other chronic disorders (of either infective or functional nature) which are of such individual and diverse character that they are relatively slighted in treatises dealing with ætiological and modifying conditions. Whatever the cause of lowered resistance which allows tuberculosis to get the upper hand, the course of the tuberculosis is certainly influenced by other physical disorders related to it or quite distinct from it. If one can banish or relieve these, the tuberculosis will often be taken care of by the improved physical resistance.

Sometimes diseases which, from the standpoint of diagnosis, must be differentiated from tuberculosis, may be associated with an actual tuberculosis. Desirable as it is to have a single cause explain all symptoms, one diagnosis will then be insufficient. The recognition of the tuberculosis may too readily stop further investigation.

Dr. Lawrason Brown's[1] series of cases of Hodgkin's disease and carcinoma with tubercle bacilli in the sputum, illustrates such coincidence and emphasizes the intricacies of diagnosis. There are, however, many pitfalls with diseases of more commonplace nature. Focal infection, such an important factor in systemic disease, plays an important part, also, in a chronic disease like

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phthisis. Four years ago at this meeting, Dr. Thayer provoked an interesting discussion on the differentiation of suspected tuberculosis from focal infections of the head. My recollection is that the tuberculosis under consideration was a matter of suspicion, because of constitutional symptoms, when definite signs of pulmonary lesion were lacking. Cases with such focal infections are occasionally found which show also physical signs of a pulmonary tuberculosis, more or less pronounced. In such instances there is even greater simulation of phthisis, and the stigmata of that disease as found in the history, e.g., the evidence of toxæmia, blood spitting, the questionable findings of tubercle bacilli and a tuberculin reaction, are confusing and leave much to speculation. In some of these cases the presence of tuberculosis is far from proven, while in others it must be accepted, but the secondary infection may fairly be considered as playing the more important part in the illness. Indeed in some instances the tuberculosis may rather be regarded as the secondary infection. The non-tuberculous infection may be the important depraving influence because of which phthisis has developed, or it may be a result of the general constitutional weakening produced by the tuberculous infection.

Some illustrative cases which I have noted fall into two groups, one where pathological conditions of the respiratory tract accompanied or simulated tuberculosis, and the other where disease of the abdomen or pelvis existed with pulmonary tuberculosis and fostered its development. In the first group are the following:

Case 1. A woman has had recurrent bronchitis and mild constitutional symptoms of toxæmia for nine months. There are definite signs of infiltration in the left upper lobe and more diffuse signs of bronchitis elsewhere. The Von Pirquet test is positive. Accessory sinus disease is noted. The patient is referred to a rhinologist and after operative treatment she returns to the sanatorium for two months. On leaving she is apparently well. Bronchitis has quite disappeared except for a few small râles in a limited area near the site of greatest original intensity. She has gained seventeen pounds and there has been no fever since her operation. The sputum has been negative. M. Catarrhalis only has been found in washed sputum. Nine months later her physician reports excellent health.

Here there was possibly an old tuberculous lesion and there was a bronchitis secondary to a chronic sinusitis.

Case 2. A man with symptoms referable to the chest for nine months, and cough, sputum, frequent bloody expectoration, loss of weight and recurrent fever for four months is found to have a bilaterial basal bronchitis, with slight changes on percussion of the left side. An ophthalmic test with ½ per cent. old tuberculin causes an intense local, general, and slight focal reaction. The sputum is negative. An extreme atrophic rhinitis is found and the whole nasal cavity is covered with adherent crusts. Treatment of this condition causes prompt disappearance of the cough, and expectoration almost stops. The patient improves greatly in general condition and returns to his work of car foreman after five weeks' treatment. Since then he has not lost a day from work in nearly five years.

A bronchitis secondary to the rhinitis may here have activated an old tuberculosis, or there may have been a recent infection which in itself was secondary.

Case 3. For four years a woman has had purulent expectoration, often persistently blood-stained. There has been frequent slight pleurisy, some dyspnœa and increasing weakness. Fever is rare. There is no anæmia. The Arneth index is consistently high. Intestinal stasis, frequent headaches and mild Raynaud's disease are accompanying disorders. The pulmonary signs are vague and inconsistent. A slight scoliosis can explain slight deformity and percussion changes. There is the history of nasal disease since early childhood for which there have been many operations including the opening of three sinuses. Repeated examinations with antiformin fail to reveal bacilli and animal inoculation is also negative. The sputum contains a practically pure culture of Friedlander's bacillus. An autogenous vaccine modifies the character of the sputum and produces local, focal and general reaction. Reaction is also obtained to 3 mg. of old tuberculin, local, general and slight focal. There is no material change in the pulmonary symptoms after six months' treatment.

A long standing bronchitis with bronchiectasis secondary to nasal disease may have, in this instance, permitted secondary tuberculous implantation, or may have furthered the development of an old lesion.

Case 4. A young farmer for a year and a half has had constitutional symptoms of a toxæmia, with expectoration, and two small hæmoptyses. He reports that twice a single bacillus has been found in the expectoration. There is reason to doubt the finding. The chest examination shows a slight sclerosis of the left upper lobe and a slight diffuse bronchitis. Repeated examinations of the sputum with the aid of antiformin are negative and animal inoculation is also negative. Much inspissated secretion is noted in the larynx and trachea which can only be removed in part and with difficulty. Small white growths embedded in the mucous membrane of the larynx and at the base of the tongue are removed with punch forceps. A diphtheroid organism in almost pure culture is obtained. An autogenous vaccine is given irregularly for nine months, during which time the patient improves. A year and a half later the patient is perfectly well with only the sign of a slight sclerosis of the left lung remaining.

There was probably an old tuberculous involvement of the left lung; but the peculiar character of the agent causing the bronchitis suggests that this organism was the cause of illness.

In these cases, with one exception, measures other than those of a hygienic and dietetic nature materially helped to restore health, and in all, the possibly tuberculous condition of the subject may be considered relatively unimportant. In all of these patients a diagnosis of tuberculosis would be reasonable, and they could readily be classed in sanatorium records as moderately advanced cases without bacilli, falling into the ranks of the 33 per cent. "bacillary cases found in sanatoria."

Notwithstanding the difficulty of proof and the vexed opinions of bacteriologists and clinicians, it is a matter of common experience that secondary, accompanying or intercurrent infections of the respiratory tract play an important, often a controlling, part in the course of pulmonary tuberculosis. The reactions to autogenous vaccines, of local, focal and general character, themselves suggest the relationship between the organism found in carefully washed sputum and the pathological process.

Von Hansemann[2] maintains not only that in many cases of phthisis the tubercle bacillus, if present at all, represents merely a secondary infection, but also that even in true tuberculous phthisis it is only one of the ætiological factors. In a majority of instances of atypical cases he considers it possible to discover the special ætiological factor concerned, and believes that in all such cases it is more essential to deal with the primary condition than to remove the bacillus.

Lord[3] in his clinical and pathological studies of non-tuberculous affections of the lungs finds that 10 per cent. of bronchopneumonias have well-marked indurative and ulcerative processes which clinically resemble pulmonary tuberculosis. Ash[4] finds that 11 per cent. of cases which come to autopsy in institutions for advanced cases of tuberculosis are non-tuberculous. We must evidently be on guard for the atypical cases.

The cases of the second group present a more clear-cut illustration of my subject, since in all of them the existence of pulmonary tuberculosis is admitted and the question of differential diagnosis does not arise.

An indolent or retrogressive pulmonary lesion may quickly become active because of the development of tuberculous enteritis which is possibly amenable to surgical interference. Material improvement can be obtained in a fair proportion of cases if recourse to the surgeon is prompt, and I believe exploratory incision, at least, is warranted more frequently than it is done.

Five patients were referred to the surgeon for short-circuiting operations for tuberculous enteritis. Two are alive, six and five years respectively, since their operations. In one of these cases (Case No. 5) an advancing pulmonary lesion was arrested and the patient has not been as well for years as she is to-day, and she leads an arduous life. A third had nine inches of a hyperplastic tuberculous cæcum removed. This condition complicated an advancing pulmonary lesion, with much cough and expectoration, and its influence upon the pulmonary condition is noteworthy. After the operation the patient coughed but three times in as many weeks and sputum was much diminished. He died six months later of spontaneous pneumothorax and was saved a good deal of suffering by the ileosigmoidostomy. These three cases emphasize the influence of a second area of tuberculous disease upon the symptoms and progress of the pulmonary lesion. Two cases died within two days of the operation. They were not good risks and the result shows that the operation should have stopped with the exploratory incision in one case. Also it is fair to say that in the other case I did not have the privilege of making the arrangements. Two months were lost after operation was first considered and the technique of the operation was subject to criticism.

Case 5. A woman, aged thirty-five, developed phthisis during lactation. There was a long standing history of irregular pulmonary symptoms and of diarrhœa. Much sputum had been swallowed. Physical signs in moderate degree were present in three lobes. A thickened, tender cæcum and sensitive transverse colon and sigmoid were felt. Marked peristalsis of the ileo-cæcal region was usually visible. Obstruction was obvious and cramps and diarrhœa were of daily occurrence. Cough and expectoration increased during three months. The pulmonary lesion advanced and bacilli were found occasionally in the sputum, and also in stool. Relief for the abdominal distress was necessary. The patient was referred to the surgeon for exploratory incision with a short-circuiting operation in view. Tuberculous patches were found in the colon. An ileosigmoidostomy was done, and at a later operation, the distal end of the ileum was converted into an ostium. The intestinal condition became more endurable and the pulmonary condition gradually improved. Three years after the operation the patient was apparently cured. Two years later the patient writes that her health, notwithstanding much strain, has been better than for many years.

Intestinal adhesions following an appendicectomy caused symptoms which simulated tuberculous enteritis and awakened an old pulmonary lesion. Surgical interference has thus far given great relief and the pulmonary condition has become quiescent.

Case 6. A woman, aged twenty-four, with pronounced history of family phthisis, of exposure, and with signs of infection of glands, lungs and rectum during fifteen years, has had mild symptoms of clinical tuberculosis for six months with recent slight hæmoptysis. The appendix had been removed four years earlier and suppuration for several weeks followed the operation. Since the operation tenseness of the abdomen and radiating pains on the right side have been frequent. For two months diarrhœa, cramps and local sensitiveness have been marked. During five months' observation there was no expectoration, but at two menstrual periods there was slight hæmoptysis. Old disease was found at the apices and sometimes an occasional crepitation was heard. The pulmonary condition seemed relatively insignificant and because of increasing abdominal distress and rising temperature an exploratory operation was urged. Unfortunately, the fæces had not been examined for bacilli. Only adhesions around the cæcum were found. Notwithstanding ether anæsthesia the pulmonary condition did not relapse. The abdominal symptoms and general health have been greatly improved during the nine months since the operation and the pulmonary symptoms have subsided. The patient has resumed work.

Chronic appendicitis may be the dominant disorder in cases in which improvement hangs fire. The removal of an appendix can change a relapsing pulmonary patient into an arrested case or hasten recovery in a patient with a recent lesion. In two instances here given ability to work at the usual occupation was quickly recovered after removal of a tuberculous appendix in one, and a non-tuberculous appendix in the other.

Case 7. A man, aged thirty-one, relapsed after a six months' period of work at the end of four years' treatment for phthisis. He had suffered a number of relapses of short duration, and, during much of the time, intestinal indigestion and abdominal sensitiveness had been marked. An expert on digestive disorders who was consulted, considered him a neurasthenic. There is evidence of long standing disease in four lobes and recent signs at the left apex. A tender appendix is found. The patient is ill for several weeks with combined pulmonary and abdominal symptoms. After two months the appendix is removed and on microscopical examination it proves to be tuberculous. Variable symptoms of indigestion recur during an additional year of "cure", after which time he is seen again. The pulmonary lesion is quite inactive, but there are pronounced symptoms of intestinal intoxication, along with a marked indicanuria. With modified diet, exercise and work, these symptoms largely disappear and quite hard work has now been carried on for eighteen months.

Case 8. A man, aged twenty-five, suffered from recurring abdominal pains for five years following typhoid fever. After four years symptoms of a mild toxæmia developed and he was treated as tuberculous. There is an indolent tuberculosis of the right lung. Cough and expectoration have been absent, but after an influenzal cold bacilli were found. The appendix can be felt and he is seen during a characteristic attack. A very long and thickened appendix attached to the sigmoid is removed, which, on microscopical examination is not found to be tuberculous. Three months after the operation he returned to his work which has been consistently followed for three years. He is apparently cured, in excellent health, and the lungs show few signs of the old lesion.

A latent focus of infection in the pelvis can produce a toxæmia resembling tuberculosis. The removal of bilateral pyosalpinx cleared up irregular febrile attacks in a case of indolent pulmonary disease. No symptoms pointing to pelvic disease had been obtained in the history and there was nothing to indicate the need of examination until pains at a menstrual period, several months after the patient first came under observation. Six years later this patient was in very good health and when last seen, three years ago, there had been no material change in the lung lesion.

Reflex and congestive disorders occurring with menstruation can so depress the general health that sufficient resistance to overcome the pulmonary disease cannot be gained in the interval.

The removal of both ovaries and the appendix benefited to a remarkable degree a woman who was so prostrated by the menstrual period that it seemed impossible that any gain could be made until the functional derangement was altered. An advanced pulmonary tuberculosis improved rapidly when the recurring prostrating headaches and severe abdominal symptoms were relieved by operation.

Case 9. A married woman, aged thirty-nine, has for two years had symptoms in varying degree of an active advanced tuberculosis. There is also mild hyperthyroidism. Two attacks of appendicitis have occurred in thirteen years. The patient has long been subject to frequent intense headaches with vomiting. Severe dysmenorrhœa is usual. Examination reveals a disseminated tuberculosis affecting all lobes. Bacilli are present. A small movable mass and tenderness are noted in the right iliac fossa. The thyroid and heart are enlarged. Hæmoglobin is 75 per cent. and the Arneth index 83. For three months there is both constitutional and local improvement. The third menstruation was accompanied by excruciating headache, nausea, vomiting and frequent micturition. Pain in the right iliac fossa was constant, radiating to the sacro-iliac region. Tenderness and rigidity were marked. After similar symptoms and signs were observed at the next period, she was referred to the gynæcologist as it seemed that further improvement was impossible in the face of such prostrating illnesses. Because of the not distant menopause, ovaries as well as appendix were removed. The appendix was bound down by a very short mesentery, but it did not appear to be diseased. The ovaries were cystic. When the patient left, three months after the operation, she was greatly improved. There was no abdominal pain, headaches were rare, hæmoglobin was 95 per cent. and physical signs had materially diminished. Four months later she writes that for periods she has been without cough and expectoration and that her health has improved in every way.

The indolent tuberculosis occasionally seen in women who give a history of excessive menstruation is possibly the result of and is maintained by this recurrent drain. I have found that sanatorium treatment alone does little for these patients and they have been referred after a short period of observation and training to a gynæcologist. Their history has ultimately been satisfactory.

Five per cent of my sanatorium patients during the last seven years have had to undergo major surgical operations with general anæsthesia;* but of twenty-one (four underwent two operations) only three have failed to be materially improved after operation. These three were all desperate cases and the patients died. The need of operation was obvious in most, but was urgent only in two cases. In spite of surgical shock and anæsthetic, the pulmonary condition in no case became worse. In some instances the improvement in the local tuberculous condition was dramatic, as soon as the basic cause of illness was removed. Seven became

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*Gas with oxygen was alone used in fifteen cases; ether was used in some combination in nine; chloroform alone or in combination in five.

"apparently cured", three "arrested", eight "improved". Of the "improved" four subsequently died.

Apart from the urgency that demands immediate operation, surgical measures evidently may be of great value in the treatment of phthisis. Their proper use is one of our responsibilities and one of our problems. Billings[5] emphasizes the necessity of the removal of the focus of infection as a fundamental principle in the treatment of systemic disease, especially of a chronic type. McArthur[6] urges short-circuiting operations when excision cannot be undertaken, for intestinal tuberculosis other than the hypertrophic form, the abdominal operation, of course, depending upon the pulmonary and general condition. Exploratory incision may be necessary. For ileo-cæcal tuberculous disease operative interference is a not uncommon surgical procedure (Maylard[7]). Lane[8] recommends radical measures to remove the depraving influence of intestinal stasis.

The tuberculous patient is of course not to be lightly subjected to operations, but time and opportunity may easily be lost by undue delay. Pulmonary tuberculosis may be taken as a final and complete diagnosis to the exclusion of any other. Unless each diagnosis is questioned, and, when established as tuberculosis, further looked into for other possible modifying disease, a considerable number of patients will fail to recover. It is, therefore, necessary to individualize in every case.

The important thing is the point of view that there may be a depraving influence within the body which can be found and remedied. Remediable disorders certainly occasionally prepare the soil for developing tuberculosis and help to further its progress when already established. When relieved of such handicaps a tuberculous patient may frequently develop sufficient resistance to obtain the relatively speedy arrest of his disease.

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BLOOD TRANSFUSION

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As far as I know this subject has not been treated in a paper before this society. However, I do not desire to have the present paper considered as a full exposition of this important therapeutic operation, but merely to serve as a way of reporting a few cases of transfusion by one of the many methods now in use.

Three years ago in Boston I first became interested in transfusion by the Kimpton-Brown method and the cases I have to report were all done with Kimpton-Brown or Vincent's paraffined tubes between February and November 1st, 1916.

The transfusion of blood, from animals or human beings, for the relief of anæmia or purpuric diseases, has always had a romantic interest for the medical profession. In the year that Columbus discovered America, Pope Innocent VIII. was transfused with blood from three young healthy adults after the remarkable method of withdrawing some of his blood, injecting it into the donors, and then transfusing the patient. All four died.[1]

Jean Daniel Meyer, a German physician, claimed, in 1667, to have been the first to perform the operation, presumably successfully.

In 1615, Libavius anticipated Crile's cannula by advocating arterial transfusion by means of a silver tube.

Experimentally in Oxford, in 1765, animals were bled to point of death and were resuscitated by transfusion by Lower.

In 1667, a Paris professor, Denis, saved the life of a patient by the transfusion of ten ounces of lamb's blood. Following this there were many cases of transfusion done and so many deaths occurred that in France and Italy transfusion was prohibited by law. Since then it has become clearly recognized that it is useless, as well as dangerous, to use whole blood from an animal of one species for

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transfusion into an animal of another species. On the contrary, defibrinated blood and blood serum, especially from animals, have been commonly used in the treatment in man of hæmophylia, hæmorrhage neonatorum and other hæmorrhagic diseases. Horse serum, coagulose, and allied products are well-known and widely-used therapeutic agents.

Kartz, in 1875, injected defibrinated blood subcutaneously with good results and Bozzolo in Italy injected it into the pleural cavity. In animal experiments, Obolinski and others used intraperitoneal injections of defibrinated blood with a resulting increase in the numbers of red blood cells and a rise in the percentage of hæmoglobin.[2]

Hayem has also shown that the injection of defibrinated blood produces an increase of hæmatoblasts. In one of my cases, it was noted after a small transfusion that the blood slides showed nucleated red cells where none were present just prior to operation. This was a case of pernicious anæmia, Case 6 in the series.

In 1847 the syringe method was used by Sotteau and in 1883 Roussel reported sixty-two transfusions with thirty successes. In 1912, Tuffier used a paraffined silver cannula and about then Elsberg's classical cannula was perfected. The literature after this date is full of reports and descriptions of ingenious methods of transfusion.

Intramuscular injections of whole blood, of 10, 15 and 20 c.c. were carried out by Schloss with very good results in cases of hæmorrhagic diseases of the new-born.

To-day the concensus of opinion is that transfusion is the operation of choice and the injection of serum or defibrinated blood are to be used only when transfusion cannot be carried out or while preparing for it. Transfusion will do what the other expedients achieve and in addition fill up empty vessels with normal blood. This brings me to the consideration of the methods of transfusion. They can readily be divided into:

1. *The direct method* by (a) the union of artery to vein as done by Murphy, Carrel and many others by vessel suture. This requires considerable technical skill and hospital environment, is accurate, prompt and efficient. It necessarily must be available only to the few skilled in vascular surgery. (b) Connecting the vessels by an interposed cannula or joining the intima of the vein and artery by a short link cannula. Many operators have perfected special cannulæ of which are well known those of Crile, the two-piece cannulæ of Bernheim[3] which telescope into each other,

and many others. In France, where tranfusion has been widely employed during the war, Andre Rendu, in the absence of special metal cannulæ has used successfully a connecting link made from a portion of a chicken's quill.[4]

2. *The indirect method.* (a) Syringe method of Von Ziemson which has become so perfected by Lindeman of New York. It is probably the best method in the hands of a skilled operator but has the disadvantage that it requires twelve to twenty glass syringes of 20–25 c.c. capacity which are expensive ($100), and several highly skilled assistants are needed. (b) Other operators collect the blood from the donor in anticoagulant solutions, such as solutions of leech extract, herudin, citrate of soda, and oxalate solutions. The mixed blood and anticoagulant is then injected into the recipient. Of these methods the best is undoubtedly the soda citrate method and a strength of 0·25 per cent. is sufficiently strong to stop clotting. One uses 100 c.c. of a stock solution of 2·5 per cent. soda citrate solution for 900 c.c. of blood. In this connexion it has been demonstrated that soda citrate solution is harmless when injected into the veins of animals provided that the quantity does not exceed certain limits, which are clearly laid down. For a patient of 110 pounds weight, 15 gm. of soda citrate would be a fatal dose and 2 gm. is the quantity needed for 900 c.c. of blood, an average transfusion.[5] A very full study of anticoagulants was published by Henry S. Satterlee, of New York, just recently.[6]

3. *Combined direct and indirect method.* The apparatus of L. J. Unger[7] which was demonstrated last winter at the Royal Victoria Hospital before this society is used to provide a method of combined cannula and syringe transfusion. In this method saline is used to flush the cannulæ and the donor receives saline during the operation. George Miller, of Brooklyn, has invented a simple cannula with a stop valve with which he needs but one syringe and one assistant and uses no saline. He has carried out this procedure in his office. (b) Paraffined tubes, Kimpton-Brown and Vincent's. These are receptacles which collect blood from the donor without an intermediate cannula or any tubing and inject it direct into the recipient's vein. There is no clotting and the amount used in a transfusion is readily measured. It is quick, safe, can be carried out without skilled assistants and the chances of contamination of the blood are nil. I have transfused 600 c.c. in twenty minutes from the first incision till the dressings were in place on both patients. The Kimpton-Brown tube I have shown on a former occasion before this society. The Vincent tube, though not graduated, has one

obvious advantage, that owing to the needle adapted to it, one can withdraw blood from the donor without dissecting out his vein.

The many methods of transfusion have the one main obstacle to overcome—clotting of the blood. In the syringe method, preliminary stages of clotting often occur. Minot[8], of Boston, has shown that blood will not clot if run through a paraffined cannula direct into oxalate solution, when chloroform is added. But clotting will occur if the blood is drawn with a syringe and then introduced into the solution. The chloroform renders inactive the antithrombin, allowing any free thrombin to clot the fibrinogen. This thrombin was not freed by flowing through the paraffined tube but it was freed even in the brief space of time while in the syringe. It would therefore appear that the syringe method even with saline or citrate solution does not totally prevent the early blood changes incidental to clotting. The paraffin method has no objection save the necessity of taking time to coat the tubes thoroughly. This I have found is quickly done with practice and at the Montreal General Hospital the operating room nurses prepare the tubes, which are always stored ready for use.

The indications for transfusion are many, and I will not go into this, as it is fully discussed in a paper by Ed. W. Peterson in the April, 1916, number of the *Journal of the American Medical Association,*[9] beyond enumerating the following conditions where it is indicated:

Acute and chronic post-hæmorrhagic anæmia; cases of pathological hæmorrhage, peptic ulcer, typhoid, blood diseases, hæmophylia, purpuric diseases, purpura neonatorum, where 90–120 c.c. transfused often saves life. In hæmorrhages of the new-born where the mortality used to be 50–75 per cent. it has been reduced to 5–10 per cent by transfusion. In infants transfusion into the superior longitudinal sinus according to Helmholtz's method is the method of choice.[10]

Leukæmias, secondary hæmorrhagic diseases, as jaundice, nephritis, sepsis, poisoning by coal gas and coal tar products are all benefitted by transfusion.

All writers agree that preliminary to transfusion certain tests are necessary. The best donors are young healthy adults and the the recipients' immediate family are no better, though more easily obtained, than strangers. I have used stranger donors in nearly all my cases and thrice donors were of opposite sex from the recipient. All persons fall into four groups as regards agglutination, and donors are best when in the same group as recipients.

A Wassermann test should be made in all cases. Then the blood should be tested for agglutination and hæmolysis. The latter will not take place where agglutination does not occur, and only about 20 per cent. of bloods that agglutinate will hæmolyze as well. The latter complication is so serious that no transfusion should be done except in the most urgent case without testing for agglutination. Even after excluding chances of agglutination, hæmolysis, loosening thrombi, introduction of excessive quantities of blood or too rapid flow, certain unknown and not understood reactions will occasionally occur. These are most often found in cases of sepsis, high fever, or blood disease, rather than in cases of secondary hæmorrhagic anæmia.

Hæmolysis with many operators is not considered a great danger. Bernheim claims it is greatly "over-rated and unwarrantably feared". Others report many cases of transfusion without hæmolysis where no preliminary tests have been done. Personally I have a holy horror of its occurrence as any operator will have who has seen a serious case of it.

The method of testing for agglutination done in all my cases is that described by George H. Minot[11] of Boston. Personally he has given me practical instruction in the tests and I desire here to record my indebtedness to him.

It is necessary to test the patient's serum against the donor's red cells and the donor's serum against the patient's red cells. For a safe transfusion no agglutination should occur either way. However, one may be forced to use a donor whose serum is agglutinative towards the recipient's cells, for here the anti-agglutinin in excess in the patient's blood serum will likely counteract this tendency. One should not use a donor whose cells are agglutinated by the patient's serum.

Hæmolysis is indicated by vomiting, respiratory distress, pain low in the back, characteristic blush, sweating, a rise of temperature, chill, suppression of urine or hæmaturia. In infections hæmolysis has been observed with rapidly fatal results.

Percy in fifty-four transfusions reports three reactions with two fatal results where tests for agglutination and hæmolysis were negative.[12]

Ottenberg and Kaliski report 10 per cent. of toxic reactions in a series of 128 cases, not referable to agglutination or hæmolysis. Skin eruptions, urticaria and petechiæ are sometimes seen and a chill and a rise of temperature occur in about 10 per cent. of cases.

Personally I have seen no reaction of any kind save where there was hæmolysis. No heart case, nephritic, diabetic or tuberculous subject should be used as a donor.

Donors will be found to vary in hæmostatic, hæmatopoietic and anti-toxic qualities. Consequently failure in cases of blood disease, pernicious anæmia, or sepsis, with one donor may be followed by success with another donor. In this connexion it has been established that immunity may be obtained in the donor with increased benefit to the patient. Ransom-Hooker[13] produced a cure by transfusing 100 c.c. of blood from an immunized donor into a boy with chronic osteomyelitis who had not been relieved after many operations. His hæmoglobin was only 30 per cent. and a prompt recovery followed. Krida[14] treated a case who had had multiple abscesses for four years with 400 c.c. of immunized donor's blood and the case was still well and had had no abscesses a year and a half after. I believe Libman, of New York, is doing similar work in immunized transfusions in cases of endocarditis due to the streptococcus viridens.

All my cases have been done in the Montreal General Hospital, and they include cases from the public services of Drs. Lockhart, Lafleur and von Eberts, and private cases referred for this treatment. There have been ten transfusions done on nine patients with three deaths, and one case of transient hæmolysis which recovered. One fatal case, the first of the series, was not due to the transfusion and it had very little effect either for good or ill. Another fatal case was due to a rapid, fulminating hæmolysis in spite of a negative agglutination test. However, my technique of testing was shortly after changed and I am now confident that the tests are more certain than with the first few cases. The third fatal case died from a repetition of the hæmorrhage for which transfusion was done as a preliminary to operation. The conditions for which the operation was done were anæmia due to gastric or duodenal hæmorrhage, two cases; anæmia due to hæmorrhage from hæmorrhoids, one case twice transfused; pernicious anæmia, two cases; anæmia due to placenta prævia and infection, one case; anæmia due to hæmorrhage caused by abortion, two cases; anæmia due to long-continued suppuration, one case.

The results will appear in the detailed case reports as follows:

Case 1. Female, private case of Dr. Lafleur, Montreal General Hospital, February 2nd, 1916, Mrs. F. X., aged sixty years. Case No. M. 309. Patient exsanguinated, comatose from gastric hæmorrhages, transfused during operation of gastrotomy by Dr. von Eberts. Donor son, healthy young adult. Tests negative. Kimpton tube used, readily filled, difficulty in getting blood to flow into her veins at left elbow, no bleeding on opening vein, which was very small. Only about three ounces, or 90 c.c. transfused. Slight improvement in pulse noted. Hæmorrhage came from cardiac end of stomach, likely varix. Patient did not rally after operation and died same night. No reaction noted. In females it is wiser to use the internal saphenous or jugular veins and a transfusion is better done prior to and not during another operation for obvious reasons.

Case 2. A. D., public patient No. 1376, admitted Montreal General Hospital February 22nd, 1916. Male. Following five weeks of continuous diarrhœa and intestinal hœmorrhage, man walked in, rapidly became worse, had œdema of hands and feet, was lemon yellow, ears were wax-like, mucous membranes colourless, dyspnœic, comatose, cerebration slow, irritable and restless, enlarged liver, cough, urine 1010, albumen, no casts, hæmorrhoids present, eye discs pale, negative. Red blood cells, 1,800,000; white cells, 53,600; hæmoglobin 26 per cent. Transfusion February 25th, Donor, S., medical student, Wassermann and agglutination tests negative. Kimpton tubes used, and internal saphenous vein of patient dissected. Operation easy and patient's colour began to improve with the first tube full. At the end of the second his cheeks were pink and ears red. Beyond trouble due to patient's restlessness there was no difficulty, 525 c.c. were transfused. A few hours later the red blood cells were 1,920,000. White cells, 17,000. Hæmoglobin 26 per cent. Next day red blood cells were 3,410,000. White cells, 11,000. Hæmoglobin 23 per cent. On the 27th the patient was mentally bright, quiet, had no dyspnœa, still some cough, and had improved in every way, regaining bladder control, had incontinence before. Subnormal temperature replaced by 100°, maximum rise 101°, pulse decreased from 128 to 88. Urine shows no blood or albumen. He had slight rectal hæmorrhage with stool, and was, on March 2nd, again transfused, Donor R, medical student. Easily, rapidly, 600 c.c. at least was transfused. He rapidly improved. Two days later with spinal anæsthesia I operated on him for hæmorrhoids, which bled on the slightest touch, and he left the hospital well about one week later. His blood count, colour and strength had almost reached normal. This was a most spectacular case.

Case 3. Private case of Dr. Lafleur, J. J. M., No. 2659. Pernicious anæmia with fever 102°, had epistaxis, hæmorrhages into retinæ, from gums and intestines, dyspnœic and restless. Aged forty-two years, heavy man, extremely ill. A donor was tested and no agglutination noted. 450 c.c. was transfused about noon April 21st. During first tube full he vomited, complained of backache. Operation took less than twenty minutes. He was restless, had pain in back, and in stomach, and skin on arms was mottled where dependant. In half an hour he had a chill and temperature rose to 105° with hæmatemesis and bleeding from his gums. His wound in the arm bled and during the afternoon he vomited blood. When seen 10 p.m. he was asleep, during the night he vomited blood several times and died during the night. There was no cardiac distress, no increase in amount of cough and his colour improved in the operating room. He had suppression of urine. The donor's blood clotted readily and he was a healthy young adult male.

Case 4. Public patient of Dr. Lockhart, No. 2239. Female, aged thirty-eight. Extreme anæmia, following abortion, bleeding up till April 14th; three days prior to transfusion; blood tests negative, red blood cells, 1,200,000; blanched, veins hardly visible, severe headache all the time. Donor was a brother-in-law and she was given 425 c.c. of blood. Her colour improved at once. Following day she had no headache and desired to be allowed to go home. Convalescence was rapid.

Case 5. Private case of Dr. Lafleur, No. 3104, J. J. McD., admitted Montreal General Hospital May 10th, 1916, hæmatemesis, duodenal ulcer, pyloric stenosis; May 17th had free bleeding. Refused transfusion till in extremis. May 21st transfused from Dr. B., house surgeon, blood tests negative, 600 c.c. given rapidly, no symptoms during operation and no reaction. Colour and pulse greatly improved. Early the following morning he had further intestinal hæmorrhages and died. This case had refused transfusion and operation earlier and from the size of the hæmorrhages it was clear there was arterial erosion in an ulcer base.

Case 6. Mr. H. S., private case, Dr. Lafleur. Pernicious anæmia, severe degree; dyspnœic; several members of the patient's family were tested and in all cases the cells of the donor were agglutinated by the patient's serum. Controls of my blood and of a house surgeon were used and finally, June 19th, he was transfused with blood from Dr. H. whose red cells were not agglutinated by the patient's serum. The reverse test was in the hurry of the work not done. A donor had been selected but on retesting a very slow reaction was obtained and he was discarded.

Vincent's tube was used and fearing trouble on account of agglutination reactions, I gave 250 to 275 c.c. very slowly. Before half the quantity was given his face and neck became suffused and he complained of pain in the head and in the stomach, this was followed by backache and an attack of retching. In an hour he had a chill with a rise of temperature above his usual range. He had no blood in vomitus, but mucous was stained and he had hæmaturia till forty-eight hours later. At this time his red blood cells were 1,600,000, white cells, 4,400, hæmoglobin 33 per cent., colour index, 1-03, and he showed typical nucleated red cells. On June 28th the patient's blood count and smears showed slight improvement and he was less dyspnœic. An attempt in September to find another donor resulted in every case in getting agglutination of the donor's cells by the patient's serum, consequently a second transfusion was abandoned.

Case 7. Mrs. A., public patient, Dr. Lockhart's service, No. 4015, anæmia following miscarriage, severe headache and blanched. Husband's serum aggutinated patient's cells. Daughter was used as donor. 250 c.c. of blood was used, Vincent's and Kimpton's tubes used. There was difficulty in getting the tubes to fill, daughter was a young girl. Patient showed an improvement in colour, her headache disappeared, her red blood cells increased 1,000,000 in two days, and her hæmoglobin rose from 23 per cent. to 35 per cent.

Case 8. S., public case, No. 3801, Dr. von Ebert's service, chronic suppuration for months, psoas abscess and joint infections, staphylococcus infection, red blood cells, 1,250,000. Several donors tested, one finally found with negative tests. This donor arrived in bad shape direct from work, perspiring, frightened and made a difficult case to handle. He early became pallid, was afraid he would lose too much blood and the transfusion had to be stopped on his account. Only 250 c.c. was transfused. This improved the patient's colour and he made more rapid progress after than he had done for months.

Case 9. Mrs. G. P. Aged twenty-two years. Second pregnancy. Admitted Montreal Maternity Hospital, September 21st, 1916. Patient had a severe hæmorrhage night before admission. She had another one of 800 to 900 c.c. the next night and during delivery, which was induced, she lost another large quantity of blood, in all probability about 1500 c.c. were lost after admission.

On the seventh day after confinement, her temperature gradually had reached 104 4-5°. On the tenth day post partum after testing for agglutination with her husband, 750 c.c. were transfused, using two Kimpton tubes, the second one being refilled. There was nothing special in the transfusion. There were no symptoms at the time, nor afterwards. No reaction of any kind took place. The most marked immediate effect was in the colour of the patient which was obviously greatly improved. Her pulse rate, which had been ranging from 130 to 155 fell within twenty-four hours to 100 to 125. Above the latter figure it at no time subsequently rose. She was immediately and entirely relieved from severe headache, from which she had been constantly suffering since her confinement. The second day after transfusion her temperature began to drop and twenty-three days post partum and thirteen days after transfusion it was 99°. The red blood cells before operation (done by a student) were 3,000,000, ten days after transfusion, 3,700,000. Patient's general condition was greatly improved and the transfusion was considered to be the deciding factor in the patient's fight against her infection.

CONCLUSIONS

All cases of anæmia due to hæmorrhage showed marked improvement without reactions of any kind. Even small transfusions, 250 c.c., markedly shortened convalescence and in two women enabled them to leave hospital in a week.

One case of pernicious anæmia was not greatly benefitted which agrees with other operators' experience and one was decidedly injured. The first case of the series I do not consider was helped or injured by transfusion.

The third fatal case died from fresh hæmorrhages, the transfusion certainly improved him wonderfully till this occurred.

Several possible other cases have been tested with available donors and on account of agglutination reactions were not transfused.

In Lyons, France, a public notice resulted in one hundred and fifty applicants coming forward in one week as donors. Personally we have found the difficulty in obtaining donors our greatest obstacle. The so-called "professional donor" of New York and Boston is as yet unknown in Montreal.

In conclusion I cannot do better than quote Crile's summary on blood transfusion: "Judiciously employed, transfusion will surely prove a valuable, often a life-saving resource; injudiciously employed it will surely become discredited."

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THE TREATMENT AND MANAGEMENT OF CONGENITAL SYPHILIS *

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SYPHILIS in infants is a disease much more to be feared than is generally thought to be the case. The infection is intense, and the mortality rate surprisingly high. Particularly is this found to be the case in institutions, as for example the Foundling Home in Moscow, in which the death rate is 70 per cent. in the first six months alone. Others report a rate varying from 50 to 80 per cent., all, however, agree as to the high death rate in the first six months. It is altogether likely that these figures are rapidly undergoing a change for the better, owing to the improvement in the treatment of such cases. While statistics of any value in private practice are hard to obtain, it is unlikely that as high a death rate exists there; however, from the above figures we are able to deduct three facts:

1st. That the first six months is the danger zone in congenital syphilis, and, as a result, greater attention should be given to early diagnosis; Wassermann tests are indicated in all cases with even the slightest clinical suggestions of syphilis.

2nd. That the cases should be kept out of the institutions as much as possible, except for diagnosis and initial therapeuses; further observation may be carried on at the out-patient clinic by the physician, and in the home by the visiting nurse. The reason for this recommendation is found to be due to their great susceptibility to parental infections.

3rd. That if such cases are kept in the hospital, the greatest effort should be made to eliminate these cross-infections. This is only possible by a system which permits of the proper segregation of cases. Such an arrangement exists in the Infants' Department of the Children's Hospital of Toronto. Here what is really one large ward capable of holding sixty-five patients is divided by glass

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*From the Wards and Laboratory of the Infants' Department, Hospital for Sick Children.

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partitions into a number of small rooms or cubicles which open from a central corridor, each cubicle having its own heating and ventilating system, running water and outside exposure to sunshine and air, with accommodation for three patients. No one but the physicians and nurses are permitted to enter the cubicle, special gowns being worn. Each cubicle is provided with soap, water and hand towels. On visiting days the parents see their babies through the window from an outside corridor. With this arrangement cases of coryza and broncho-pneumonia, etc., can be grouped in their respective cubicles, and so designated by red crosses on the doors. The protection afforded by such a system is well shown by the fact that of some three hundred cases of severe gastro-intestinal diseases, not a single instance of cross-infection in the form of broncho-pneumonia has appeared during the past year. Such a protection must of necessity lessen the mortality in a disease in which the resistance is lowered and cross-infection thus favoured. Besides protecting the children in this way, it is seen that the cases promptly leave the hospital after treatment in order to obviate hospitalisms. As mentioned above, the cases are watched and advised as to the feeding and general hygiene from the out-patient clinic, in conjunction with an efficient follow-up system under the Public Health nurses. In this way, then, by a cubicle system minimizing cross-infection, and secondly by a follow-up system improving home conditions, we are endeavouring to lessen the mortality in a field hitherto neglected, but promising great results.

Therapeutic measurements. Equally great strides are being made in the treatment from a therapeutic standpoint, with the advent of the arsenical salts for intravenous injection. In the old days of high mortality the treatment was largely mercurial and although splendid results were obtained, there is no doubt that greater results will come with the treatment by these salts. The preparation which has been used almost entirely in the Infants' department had been our own Canadian product, "Diarsenol".

Dosage. It has been the practice to start with 0·1 gram. When one remembers that the adult dose is 0·3 to 0·6 grams, it might appear that too large a dose was being used. Such has not proved to be the case—not one infant having shown any of the constitutional reactions so frequently found in the adult. The treatment is repeated in ten to fourteen days, and continued till a negative Wassermann is obtained.

Preparation. The dose is dissolved in about 10 c.c. of sterile freshly distilled water. The smallness of the amount allows the use of a syringe and quicker injection of the dose, a fact of great importance in dealing with infants. In some cases, however, we have found that thrombosis has followed the injection of the stronger solution into the small vein. Owing to the smallness of the amount to be titrated a weak sodium hydrate solution is used, usually 5 to 8 per cent.—which results in a more accurate titration.

Injection. The most prominent veins in infants are usually the external jugulars, so that this vein is most often selected. For successful intravenous injection a needle of small calibre (hypodermic size), with a short, sharp bevel, gives the best results. Disappointment follows the use of poor needles, while those with a long bevel are often the cause of the vein being transfixed. The infant is controlled by being wrapped in a sheet or blanket, and held on its back on a table with the head suspended over the edge and rotated to either side in order to distend the vein. Vigorous crying fills the vein with blood, making it much easier to enter. The syringe is sufficiently large to take up the diarsenol solution and still have room to draw blood into it to prove that the vein has been entered. The solution is then slowly injected.

Should the child be too fat none of the veins will be visible. Sometimes, under these circumstances, a vein at the elbow is exposed as in transfusion. This involves considerable technique, so that the course usually adopted is to inject into the superior longitudinal sinus through the anterior fontanelle. This proceeding is not so difficult or dangerous as one might think. In the first place one has a fixed blood vessel in a definite position, with a width of not less than a quarter of an inch, usually five-sixteenths of an inch in the new-born. It has been found by experience to be more accessible than a movable vein of smaller calibre. For this purpose a needle of about 20-gauge or a transfusion needle is used. The child is held in the same position as when entering the jugular vein, except that the head is held firmly in the middle line, and slightly flexed. The operator stands at the side of, and facing the child, holds the syringe so that the needle enters the sinus from before backwards, at an angle of about forty-five degrees. The bevel of the needle is held parallel to the skin. This allows the opening in the needle to communicate with the sinus just as soon as the needle enters the sinus, besides lessening the danger of the point of the needle transfixing the sinus. The latter accident has happened once in the writer's experience, while blood was being withdrawn for a Wassermann reaction. At that time about 5 c.c. of cerebrospinal fluid was first withdrawn and then by pulling the needle back into the sinus, the necessary amount of blood was added. The child was closely watched but no sign of irritation was noticed. It may also be added that on no occasion while using the sinus, whether it be for injecting diarsenol, or for the purpose of withdrawal of blood for blood culture or Wassermann reaction, has any unfavourable symptom appeared. Needless to say the blood is drawn into the syringe before the diarsenol is injected.

Results. At a later date it is intended to publish a list of cases treated. At present just a few remarks as to the efficiency of the drug, and some unusual reactions may be cited.

Baby F. was admitted to the infant ward with a marked syphilitic rash on the face, hands and buttocks, enlarged spleen, liver and lymphatic glands, and extreme degree of rhinitis. A class of fifth year men saw this child given 0·1 grs. of diarsenol; three days later not one of them recognized the infant, owing to the remarkable disappearance of the signs during the intervening days.

One must recall in connexion with syphilitic infants, that they frequently succumb quite unexpectedly without any relation to the giving of the diarsenol, probably due to a sudden flooding of the system with spirochætes. One such incident happened in the ward in connexion with an infant which had just been admitted for treatment; it was in good condition but died suddenly during the night before any treatment was given.

Another type of case was that in which death followed five days after the usual injection of diarsenol, no untoward symptoms having occurred in the meantime. It may be that occasionally the diarsenol acts as a provocative dose in the adult, i.e., in liberating an overwhelming number of spirochætes into the circulation and so causing the death of the infant. Such instances are seen only occasionally, and should in no way detract from the treatment with diarsenol, as in all probability such cases would be fatal even without diarsenol.

Summary. The prevention of cross-infection by means of the cubicle system is most important in order to reduce the mortality. This may be more efficiently accomplished outside by the supervision of all cases from a clinic, and the assistance of the Public Health Nurses. The greatest mortality is in the first six months so that early diagnosis and intensive treatment should be encouraged. Diarsenol offers the most efficient remedy from a therapeutic standpoint. The external jugular vein and the superior longitudinal sinus are the avenues by which the salt may be injected into the blood stream, so far without any untoward results.

THE MODERN TREATMENT OF SYPHILIS

By Lieutenant-Colonel L. W. Harrison, D.S.O., R.A.M.C.

I THANK you for the honour you have done me in asking me to read a paper before your society. I have chosen the modern treatment of syphilis because apart from the fact that syphilis is the most important cause of wastage from disease which affects the Army, it is going to concern us more intimately after the War than it has done in the past, and the more generally a good idea of its management is diffused the better it will be for society in general.

At the present moment syphilis is, in England, at any rate, too much the preserve of the specialist. How often one hears a practitioner say he knows nothing about syphilis and I am afraid, not from a sense of false modesty either, he seems to take a pride in this rather than otherwise, in many cases.

I think that it is a very great pity that this should be so, as syphilis is so widespread that most of its management really falls to the general practitioner. Anyone will agree that if diseases were studied by their prevalence and effect on society in general, syphilis would take a very high place in importance. But the fact is that while the average new graduate will tell you the exact method of reaching the Gasserian ganglion and excising it, or all about the bundle of His, and its vagaries, he has the very vaguest idea as to the diagnosis of syphilis. As to its treatment, he may know that "606" or something is used nowadays, but how much to give, when to leave off, and all the other points he knows so well about remedies for many other diseases, the question merely frightens him. He says, oh, this is a specialist's game, and that is the view I am afraid he continues to hold. The result is that the average patient, whose whole future depends on a correct diagnosis and a sufficient treatment, receives some rather vague advice and ends up with taking a few pills with perhaps a dose of salvarsan at the hands of an expensive specialist until his outward symptoms have disappeared for the moment and he is tired of the treatment.

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Syphilis will continue to be the national scourge it is until it is universally studied. When it is, there will be a universal determination not to treat it symptomatically only, but to eradicate it whenever possible.

The modern treatment of syphilis is bound up now in the administration of the newer arsenical compounds which you know familiarly as "606", "914", "Galyl" and perhaps "Luargol" or "102". As you know there are three preparations of dioxydiamido-arsenobenzol or "606", viz., the original salvarsan, arsenobenzol, and kharsivan; and three of the formaldehyde sulphoxylate derivative of "606", viz., the original neosalvarsan, neoarsenobenzol, and neokharsivan. Regarding their respective merits, as far as I have been able to judge, salvarsan, arsenobenzol, and kharsivan are alike in all their effects, and I think the same applies to neosalvarsan and neoarsenobenzol. Neokharsivan is out of action for the moment and will not be re-introduced to the market until it has been freed from certain undesirable qualities. It will save time if I speak of all the available preparations of "606" and "914" simply as salvarsan, with the proviso that as I think that neosalvarsan is therapeutically not quite so active as the original preparation, I always calculate 0·9 grm. of it as equal to 0·5 grm. salvarsan.

As to galyl, as far as can be judged, its immediate effect is equal to that of the other preparations. Whether it will prove as good in the use, I cannot say at present. I fancy it will turn out to be similar to neosalvarsan. Luargol, which is a combination of "606" with silver and antimony, is on trial. I can only say that its immediate effect seems to be about twice as great as that of salvarsan since 0·15 grm. of it causes spirochætes to disappear about as quickly as 0·3 grm. of salvarsan. If it proves to be as permanent in its effects it will supersede salvarsan, as it is much more stable and convenient to administer.

The next and most important question is the proper use of those remedies in the treatment of syphilis. How much shall we give before we say to the patient that now we can wait and let the question of further treatment depend on blood tests and results of other examinations to be carried out from time to time? It is a question about which there is much confusion at the moment. At one extreme we have the belief, which dies very hard that one or two doses of "606" is sufficient to cure any case of syphilis, and at the other we have the pessimists, who hold that salvarsan does not cure syphilis, however much of it one may give; I think neither is right, but between these extremes how shall one choose amongst the various views which are stoutly maintained in the literature. I will not discuss all the views which have been advanced on the subject as it would take many hours to do so and we should not be much nearer the solution of the problem in the end. As a matter of fact, the very great majority of writers who have expressed their opinions on the amount of salvarsan which is necessary for the average case of syphilis, have not been in a position to judge the question properly.

They have been unable to follow up their cases systematically afterwards, and have had to trust mainly to impressions, so I hope I may be pardoned if I confine myself to a discussion of the results of some investigations carried out at Rochester Row Military Hospital before the war, and those of the German Naval Surgeon, Gennerich, who was able like us to maintain a large control of his patients afterwards and was therefore in a better position than anyone in civil practice to judge the results accurately.

When salvarsan was first introduced we commenced at the Military Hospital, Rochester Row, a systematic investigation with the object of determining the minimum amount of salvarsan, or salvarsan and mercury, which one should give to a patient before stopping and letting the question of further treatment be decided by the result of blood tests and other examinations. We were very well situated for an investigation of this kind as we were able to keep in touch with our patients for as long as they remained in the army, and we made full use of our opportunity.

The method of investigation was as follows: A given series of cases was put on a definite amount of salvarsan, or salvarsan and mercury, and when sufficient cases had been collected to enable us eventually to judge the value of this line of treatment, another series was commenced in which a greater amount of treatment was given.

NOTE 1. *Courses of treatment tested at Rochester Row before the War.* (1) One subcutaneous injection of 0·6 grm. salvarsan. (2) One intravenous ditto. (3) Two intravenous ditto at interval of two weeks. (4) One intravenous of 0·6 grm. followed by three of 0·3 grm. salvarsan at weekly intervals. (5) Three intravenous of 0·6 grm. at intervals of two weeks and four weekly calomels during same month. (6) One intravenous of 0·6 grm., nine weekly mercurial cream and one intravenous of 0·6 weekly mercurial, one of 0·6 grm., five more mercury, and one of 0·6 grm. salvarsan at end. Last course was followed by 30 per cent. relapses, chiefly serological.

Tried in France. Eight salvarsan 0·3 grm. and six mercury in a month. (2) Three salvarsan 0·3 grm. first week, two weeks interval, two salvarsan of 0·3 grm. One mercury per week throughout. Within eleven months after first course mentioned, six cases readmitted for clinical relapse out of 727 cases treated.

In this way, excluding the intramuscular or subcutaneous cases which I will deal with separately, we collected six groups of cases, in which each successive group had been treated with a greater amount of salvarsan, or salvarsan and mercury, than its predecessors. After completion of the course each case was examined monthly for clinical signs and every three months a specimen of the blood was sent for the Wassermann test to me. The results were carefully recorded against the various forms of treatment tried and summed up in the end. The investigation involved a tremendous amount of labour. We had to follow men all over the Empire with our enquiries, and I was regularly testing specimens of serum from Egypt, South Africa, Malta, Gibraltar, and even India. Altogether I should say, that not less than five thousand Wassermann tests were carried out on the blood serums of patients under observation after treatment by the courses we were testing. As I mentioned, the courses tested were progressively increasing. In the beginning a group of forty cases was treated with a single intramuscular or subcutaneous injection, but we had to abandon this form of treatment on account of the pain it caused. I mention it now only because I should like to say that I think it unfortunate that the subcutaneous method of giving salvarsan is not practicable as I believe that, dose for dose, it is more efficient than the intravenous methods. If a painless salvarsan could be found I believe that it would quickly supplant the original preparation. We adopted the intravenous method before salvarsan was on the market and eventually tested six different courses as follows:

(1) A single intravenous injection of 0·6 grm. (2) Two intravenous of 0·6 grm. at two weeks interval. (3) A full dose of salvarsan followed at weekly intervals by three doses of 0·3 grm. (4) Three full doses of salvarsan at intervals of two weeks and four injections of calomel in the same time, the course lasting a month. (5) A full dose of salvarsan, then nine injections of mercury at intervals of a week, and at the end of nine weeks another full dose of salvarsan. (6) A full dose of salvarsan, five injections of mercury in as many weeks, another full dose of salvarsan, five more mercury, and a dose of salvarsan to finish off with.

It would be too long to go into all the results in detail and I must keep to the main conclusions. Our results progressively improved and those which followed the last course which we tried, that is to say, salvarsan and then mercury, proved the best. They were disappointing, however, because although the clinical relapses had become almost negligible, the serological relapses brought recurrences within a year of the termination of the course up to something like 30 per cent. We counted as a serological relapse any place where the blood gave a positive reaction to the Stern test. I might explain here, as one always should in mentioning Wassermann tests, that I have always tested blood by the original and by the Stern modification. The original was made as delicate as I dare make it, but was never so delicate as the Stern, in fact, I would not trust the Stern test alone for an original diagnosis, as I think it occasionally gives non-specific results. I used it as a check on our salvarsan results, so as to represent them in the worst possible light.

We published our results in detail at the last meeting of the British Medical Association before the war, and there I indicated that I did not think the results were good enough, by announcing that we had already started to investigate a much more strenuous line of treatment. I might say that I had expected better results from the three salvarsan and ten mercury course and was very disappointed to find the Wassermann relapses so high.

Salvarsan has further spoiled us, however, and before I go on to speak of Gennerich's results, which must affect our future line of action, I should like to show the improvement which our three salvarsan and ten mercury course produced over the results we are getting in the pre-salvarsan period, when we had to rely only on mercury and iodides. I worked out the clinical results of mercurical treatment in three hundred cases which had been treated with regular mercurical injections, and found that over 80 per cent. had had to be readmitted to the hospital for clinical relapse within the first year. I tested the blood serum of over four hundred cases taken three months after completion of two years regular treatment by mercurial injections, and found that nearly 40 per cent. gave a positive reaction to the original test and 75 per cent. a positive to the the Stern test.

Reverting to our "606" results, one might say, "What do a few Wassermann relapses matter as one can always give more treatment as soon as the blood is found to be positive?" I think that it matters very considerably. In the first place not every patient remains under our care long enough to allow of treatment and observation and then treatment again if necessary. What I mean is this, that one may give a patient a certain course of treatment and three months later, he may have disappeared from our control, uncured, when if the treatment had been carried on into that period of three months, the result would perhaps have been different. On that ground alone we should make the best possible effort to obtain a cure out of hand. Again, there is overwhelming evidence to show that patients who relapse, even though it be only serologically, almost always show pathological changes in the central nervous system. Whether these changes occurred so frequently in the pre-salvarsan period one cannot say. The cerebro-spinal fluid was not examined so regularly then as now, but if we may judge by the work of Ravaut they probably did. In any case there is always the risk that the relapse may show itself in the form of some disastrous lesion of the central nervous system. This is one danger of salvarsan treatment. The course is so short that after it the patient may become the prey of unrestrained spirochætes in the central nervous system. In the old mercurial days, if under regular treatment, he was constantly taking an antisyphilitic remedy and therefore keeping the spirochætes in check. Lastly, there is a very good economical reason and that is, that relapse cases need far more slavarsan to cure them than fresh ones, so that in the end one may find that one has used really more salvarsan per case, by giving an insufficient course in the first instance, than if this had been sufficient.

As to the amount we should give in the future, we have a guide in the results which Gennerich published early in 1914. Gennerich was situated much as we were as regards facilities for following up his cases afterwards, being a naval surgeon, and his results seem to me to be particularly trustworthy. He employs every means possible, including the systematic examination of the cerebro-spinal fluid, provocative injections of salvarsan, and regular blood tests to ascertain the results of his treatment, and his work has, very rightly I think, been largely followed in Germany. From a very early date Gennerich adopted a much more strenuous line of treatment than these which we have investigated.

NOTE 2. "*Gennerich's*. Primary cases with negative Wassermann, fifteen calomel and six to eight salvarsan of 0·4–0·5 grm. (2) Ditto with positive Wassermann, same course, followed in twenty-one days by two to three doses salvarsan. (3) Early secondary, six to eight salvarsan. If Wassermann not negative in two weeks follow up with four doses salvarsan in thirty days from end of second course. Calomel fifteen injections at first then another fifteen after nine weeks' rest. Calomel injections commence about three weeks before salvarsan. Salvarsan given at the rate of six to eight a month, doses of 0·4 grm. being given every four or five days, and those 0·5 grm. at intervals of not less than a week. First course lasts two to three months and subsequent ones about three weeks each.

"Results reported by Gennerich. Out of ninety-two primary, one positive Wassermann after six months and two showed slight change in cerebro-spinal fluid with negative blood. Out of seventy secondary, three (treated with neosalvaran) clinical relapses; and one positive Wassermann after eight months. Period of observation not less than twelve months in any case."

His latest course was as follows: He divided his cases into four categories—(1) Early primary with negative Wassermann. (2) Primary cases in which the Wassermann had become positive. (3) Early secondary, and (4) later, i.e., recurrent cases. Early primary cases received 3·0–4·0 grm. salvarsan in six to eight injections of 0·4–0·5 grm. each, and fifteen injections of half a gram calomel in about five weeks. Primary with a positive reaction received this course and a follow up course of two to three injections of salvarsan after an interval of twenty-one days. Early secondary cases received six to eight salvarsan with fifteen calomel injections for the first course, which lasted two or three months, then four injections of salvarsan after an interval of thirty days, and two to three salvarsan injections after another thirty days. The second course calomel injections commenced nine weeks from the last calomel injection of the first course. The treatment was guided thoughout by systematic examination of the blood and cerebro-spinal fluid. Recurrent cases were treated with a succession of small courses of salvarsan and mercury, and Gennerich indicated that he had little hope of permanent cure in such cases. The results in primary and early secondary cases were extraordinarily good. Out of ninety-two primary which were observed not less than one year afterwards there were only three relapses of any kind, and out of seventy early secondary cases there were four relapses. Most of those relapses would not have been detected but for tests carried out after provocative injections and examinations of the cerebro-spinal fluid.

Influenced by a comparison between our results and those of Gennerich, at the conclusion of the paper read before the British

Medical Association, which I have mentioned, we announced that we proposed to treat a series of cases on this principle: to primary cases with a negative Wassermann, eight injections of 0·3 grm. salvarsan with corresponding mercury, and to those in which the Wassermann reaction had already become positive, the same course was to be repeated after an interval of one month. We had hardly commenced this course when the war broke out and I thought that I had seen the last of venereal diseases for some time.

This was not to be. At the beginning of last year I was required to organize the treatment of syphilis from a portion of the Army under anything but ideal conditions. The problem was by no means an easy one to solve. On the other hand, experience showed that we ought to give an average of 4–5 grm. salvarsan in ten or twelve injections in a course lasting about three months. On the other hand there was the necessity of getting men back to duty as soon as possible, the shortage of salvarsan, and the shortage of medical officers to give it. As a matter of fact, I found it impossible at first to spare more than 1·8 grm salvarsan per case. After a few weeks I discovered a new source of supply and increased the course to 2·4 grm., which was given in eight injections of 0·3 grm. with six of mercury. I calculated that if this was not as much as I should like to give, it was better than any we had tried before and we should have a very small percentage of clinical relapses after it. At any rate, the amount we have was as much as the supply would stand and I had some very anxious periods on that score. Actually, the last report I received regarding this course showed that out of 727 cases that had completed it by May in last year, six had been re-admitted for clinical relapse, so that the event justified my original calculations as to clinical relapses. At the end of last year, we increased the duration of the course to seven weeks, thus: three salvarsan in a week, two weeks' interval, two salvarsan in a week, two weeks' interval, and lastly three salvarsan. The fortnightly intervals were introduced to avoid any cumulative effect as we had been getting some severe cases of dermatitis, and I thought that possibly we were piling injections so quickly one on top of the other, that we were allowing no time for the development of warning symptoms in susceptible cases before they had received an awkward amount of "606" to get rid of. We took advantage of the increased length of the course to give extra injection of mercury. I think, apart from the added dose of mercury, this is therapeutically a better course than that which lasted a month, since length of time over which the course is spread, is a factor in the case. When the course is compressed into too short a time, a number of spirochætes which are buried in sclerosed patches may escape, as the salvarsan cannot reach them. When it is prolonged, nature has time to open out these scleroses and the dose of salvarsan can get at them. Since my return to England I have advocated in the same time a course of injection in which the salvarsan is progressively increased and a total of 2·7 grm. given. It involves much more work, I am afraid, than its predecessor in England, but I look on it still as a compromise with war conditions and when the war comes to an end, as well as now whenever practicable, I shall advocate the giving of considerably more salvarsan than is routine at present.

No doubt from the point of view of getting men back to duty and keeping them there for a useful number of months, much less salvarsan would suffice, but we owe something to the future. The war will not last forever and all our syphilitic patients will not be killed in it. In any case, there is going to be much more syphilis in our respective countries than we had before and I think it our duty to do the best we can to get the highest possible percentage of cures. We cannot keep our patients under our care for the ideal length of time, but we can watch every opportunity of attaining the ideal. That was the principle on which I increased the course in England and recommended a blood test after fifty days. I calculated that in the case of a large number they would not be needed abroad immediately, and it would be practicable during their period of training at the bases to keep men under treatment and observation longer than is possible abroad.

There is a certain amount of risk in the course which is now advocated. Not from death in convulsions, as I think that is prevented by starting with small doses cautiously increasing, but from dermatitis and toxæmia. The percentage of this, counting every case in which the skin is at all affected, has worked out at 1·17, and the deaths were less than one per thousand of all cases. The dermatitis has not been reduced in numbers by increasing the length of the course, but the proportion of severe cases has become less. I have gone very carefully into the facts concerning those cases who died and have come to the conclusion that the only way to avoid all risk of fatality, is either to reduce the quantity of salvarsan or to increase still more the intervals between injections. To reduce the salvarsan would have the effect of increasing the number of uncured cases, and eventually, the disablement and mortality from syphilis, while the further prolongation of the course would naturally increase the total syphilis wastage. On the whole, I think, the present course is justified at this time. We expect now to face some risk and in any case, I think we can reduce the danger of the present course, such as it is, by attention to certain points which I might mention. One great danger in cases of dermatitis is pneumonia. It seems to me that in this respect they are like burn cases. In fact some of the cases I have seen were indistinguishable from burns, and they should be protected accordingly. Two at least of our fatal cases were patients with mild dermatitis, who commenced pneumonia after a bitterly cold day with a strong northeast wind. Another feature of dermatitis cases is the stripping of intestinal epithelium which occurs and I believe this is responsible for the toxæmia, which may be a marked feature of the cases. I think it is also responsible for the irritating manner in which the symptoms ebb and flow. I believe that these patients do much better when attention is paid to the prevention of intestinal toxæmia by suitable dieting and medicine.

I am afraid I have detained you too long, and will conclude by sketching out my ideas of the treatment we should adopt in primary and early secondary cases when the war is over and we can keep our cases under our care for longer time than at present.

To primary cases, I would give two courses of 2·7 grm. salvarsan, with 9 grains of mercury in the first and 4 grains in the second, each course lasting nine weeks. The salvarsan would be arranged similarly to the course we are now using, but with intervals of three instead of two weeks, and with an interval of one month between the two courses. In these cases, I would strongly recommend an attack on the primary sore either by excision, cautery, or the energetic application of calomel ointment. I usually recommend these patients to try to rub the sore with 30 per cent. calomel ointment. To cases in whom the Wassermann reaction has become positive, I would give three such courses. The intervals between the courses should be occupied with the taking of iodides in some form. I do not think there is any danger in commencing salvarsan at once and believe that Gennerich's results would have been better if he had not wasted time with calomel injections first in these cases.

The best prognosis is undoubtedly given by early primary cases, and I would urge upon you the very great good which can be done by spreading amongst the lay public the importance of paying serious attention to all venereal sores with a view to the earliest possible diagnosis and treatment. Needless to say, it is the duty of all doctors to whom patients apply for advice for any venereal sore, not to waste time, but to use every endeavour to make an early diagnosis.

As to the great question how long the patient should be kept under observation afterwards, and the tests which should be applied before we give him a clean bill of health, I find it extremely difficult to answer. Gennerich holds that a primary case with a negative Wassermann can be allowed to go free if he has not given a positive reaction at any time and his cerebro-spinal fluid has remained negative after provocative injections of salvarsan for a year from the end of the treatment. In cases where the Wassermann reaction was already positive when the treatment was commenced, he continues observations and tests for two years from the termination of the treatment. He instances eleven marriages with healthy offspring which he allowed within two years of infection on the strength of his treatment and negative tests afterwards. This may sound very drastic, but I think the best plan is to think out what one would require if one were oneself so unfortunate as to contract syphilis. Salvarsan is an enormous advance on former treatments, witness the comparison I made between the three salvarsan with ten mercury course and purely mercurial treatment, but it is still young and syphilis is a disease which may have terrible consequences for others, and I would recommend the greatest caution about that clean bill. I suggest in any case not less than two years' observation, consisting of regular blood tests, although I am bound to say that I have not yet seen a primary case which was negative at the end of the first year of observation, give a positive afterwards.

In conclusion I would like to say a few words with regard to a method by which there is some hope that we may be able to intensify the therapeutic action of salvarsan, and therefore reduce the amount which it is necessary to give. We have been trying the effect of injecting collosol iodine before starting salvarsan and have obtained some interesting results. In a few cases where we have injected, 100–200 c.c. collosol iodine, on one day and 0·1 grains salvarsan on the next, we have been unable to find the spirochætes twenty-four hours after the salvarsan in action. In control cases which received simply 0·1 grains salvarsan they were if anything more numerous and their activity greater. Naturally one must not hope too much from these results at present, but you will agree that they are distinctly interesting.

An interesting discussion followed the reading of this paper and Lieutenant Colonel Harrison in his reply said:

With regard to the thrombosis caused by "luargol", it was certainly very troublesome and I thought at one time that we should have to give up luargol on this account until I hit on this plan which seems to have solved the problem. We make up the luargol so that the dose is contained in 20 c.c. which we run in from an infusion funnel. As soon as the 20 c.c. has run in we turn on the saline and run in anything from 150–200 c.c. so as to wash the vein wall thoroughly free from remnants of luargol.

Regarding the utility of having a Wassermann test on the fifty-second day, I do not think this is a waste of labour. The idea is that if the case is not cured the last dose of salvarsan may have acted as a provocative and cause a positive reaction which might not be apparent three months later. Just now we cannot keep cases longer for a blood test and I think that very probably a test on the fifty-second day is just as good as one three months later. As to the treatment of cerebro-spinal cases, I must confess myself rather sceptical as to the value of intrathecal injections. I have seen cases of cerebro-spinal syphilis improve very markedly simply after lumbar puncture without injection On the other hand I had cases which recovered perfectly from the ordinary clinical point of view under a number of courses of salvarsan and mercury, with iodides between the courses. They were left with slight pathological changes in the cerebro-spinal fluid which intrathecal injections of salvarsanized serum failed to improve. As to the rationale of attacking the primary sore, the idea is that deep down in the sore, in the middle of areas possibly surrounded by thrombosed vessels, there may be spirochætes lying latent to which the salvarsan cannot be carried. One fears that later when that area has become organized and new vessels formed in it, those spirochætes may gain an entrance to the circulation. I think it is established that recurrences of the primary sore are much more frequent now than they were in the pre-salvarsan days. In the old day's when a patient relapsed the clinical nature of the relapse was more like that which occurs in untreated cases. For instance, say a relapse occurs in six weeks, treatment having commenced in the primary stage, the relapse under purely mercurial treatment would be an early secondary manifestation, while if it occurred six months later, it would be more of the type of a late secondary, such as an ulcer on the side of the tongue. One would judge that in the case where the patient had been treated only with mercury, the spirochætes had been acting on the tissues all the intervening time and that the latter react accordingly, while in the salvarsan treated case there had been no spirochætal action on the tissues and they behave as if they had been invaded afresh. In other words, I think it probable that in the purely mercurial cases the latency is apparent only, while in the salvarsan cases it is real. I could give you many instances in which the manifestations of a relapse after salvarsan were an exact repetition of the symptoms which the patient showed when he first came under treatment.

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It is reported in the *Edmonton Journal* that the people of Athabasca, finding it impossible to induce a medical practitioner to settle in that district, have issued a number of tickets which are being sold to residents of the district within a radius of twenty-five miles of the town and which entitle the holder to free medical attendance for himself and family during a certain period. The money thus subscribed will comprise a guarantee fund and when a sufficient amount is secured, a certain honorarium will be offered to a practitioner on the understanding that, if he accepts the offer, he is to collect no fees from patients.

* * *

The following figures are taken from a resumé of the Annual Report of the Inspector General of Hospitals in Australia which appeared in a recent issue of the *Medical Journal of Australia.* Since the Mental Hospital at Parkside, South Australia, was opened forty-five years ago, 10,778 persons have been admitted to that institution. Of these 59·9 per cent. have been discharged "recovered". The death rate has varied between 5·2 per cent. in 1867 and 12·8 per cent. in 1903, the average percentage being 9·3. During the year 1915 there were in South Australia 2·59 insane people to every 1,000 population; in Western Australia the ratio was 3·17 to 1,000; in New South Wales, 3·79 to 1,000, and in Victoria 4·13 to 1,000.

ANTI-TUBERCULOSIS WORK IN A SMALL CITY

"THE VISITING NURSE"*

By Frank C. Neal, M.D., M.R.C.S., L.R.C.P.

Peterborough, Ont.

THE subject which has been assigned to me, is Anti-Tuberculosis Work in a Small City, and the part played in that work by the visiting nurse, or sister.

I understand further that the type of city to be discussed is one without a sanatorium for the treatment of tuberculosis, one without a clinic or dispensary, one indeed without an enthusiastic interest by the majority of the people.

It is, in reality, facing the problem of beginning and developing anti-tuberculosis work, where the sole stock in trade is an overwhelming need, and a limited number of people with an interest in the work, and a knowledge of the disease.

In such places, although the need for a sanatorium is very urgent from the standpoint of the physician, still it is possible to accomplish a great deal without a sanatorium, and in fact it is a debatable question whether wisdom is shown in taking this step too quickly.

A firm foundation should first be laid so that there will be no danger of the work going back, when once started. The general public should be instructed regarding the nature of tuberculosis—the method of contagion, its curability and general treatment. From this will follow, under the wise guidance of the visiting nurse, a desire and resolve among those coming in contact with the disease to prevent and eradicate it as far as possible. Further, a philanthropic interest among those able to help from a financial standpoint should be aroused, and steps taken to impress upon the civic authorities a realization of their responsibility for a larger share in the work.

With this groundwork, it will usually be found that a demand for a sanatorium will in good time come from the people themselves; it will then be an institution which will have come to stay, and one which the civic authorities will help to support as a matter of course.

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On the other hand, if under the leadership of a few interested people, a wave of enthusiasm be created, sufficient to raise funds to build a sanatorium, without the necessary foundational work, the great danger exists that the enthusiasm may ebb and the workers find themselves with an expensive institution on their hands, which cannot be kept running because of lack of support.

And as this lack of support is merely the result of lack of knowledge, we find ourselves confronted with the absolute necessity of beginning anti-tuberculosis work by a campaign of education.

Perhaps you will allow me just here to outline for you the steps we have taken in our own city of Peterborough—a city of about 25,000—as the work there is probably fairly representative of what may be done in a city of this size.

In 1911 a few who were interested in anti-tuberculosis work formed a small organization. This was incorporated by letters patent and became known as "The Peterboro Health Association." Soon after, we became affiliated with the Canadian Association for the Prevention of Tuberculosis in order to gain advantage of their experience and secure their literature, which with other leaflets and booklets on the subject, was freely distributed. As a further means of bringing the subject before the people, prominent outside speakers experienced in such work were invited to speak before public gatherings, while local laymen addressed the congregations of the various churches along these lines, soliciting their help and interest. Advantage was also taken of the day set apart by the Provincial Government, when special instruction is to be given on this subject in the public schools, thus reaching the homes through the children.

A little later an auxiliary of ladies was formed, the members of which held a "Made in Peterboro" Fair, by means of which, together with a sale of health calendars and christmas stamps, over $4,000.00 was realized. The educational value of this enterprise was kept in sight throughout, and in all departments of the Fair the name of the Peterboro Health Association and its aims were kept well to the front.

Having thus secured a financial start, a nurse was engaged whose services were given free to all tuberculous patients, who were willing to accept them, and on the whole a very satisfactory amount of work was accomplished.

However, this first year's work convinced the association of the inadequacy of having but one nurse, and that one given over entirely to tuberculosis work. In the first place, the old prejudice against having it known that tuberculosis exists in the home was felt, and often people would forfeit much-needed nursing care, rather than have the neighbours see the tuberculosis nurse coming to their homes. Then, too, in her rounds, the nurse saw many general cases urgently in need of nursing care, but as her work was to attend to tuberculous cases, these had to remain neglected, and as this special nurse's visits disclosed many cases of general disease, so it was seen that a nurse doing general work would be in a position to report many cases of tuberculosis which otherwise would not be reached. Again, it was thought that if general work were done, it would be easier to gain entrance into all homes, as tuberculous patients would not feel that their disease was the only one singled out for attention.

The standpoint of the various doctors had also to be considered, and as some were not as interested in tuberculosis work as others, it was felt that more general coöperation among the doctors would be secured if there were a nurse available for general as well as special cases.

It was also felt that the time had come for a more complete organization, for although during the first period a small, carefully chosen committee was given much latitude in order to work out details of administration, it was now felt that a membership society with a small yearly fee, and a general distribution of work, would be advantageous. This would not only mean more friends and helpers, but would also bring in a substantial sum in subscriptions.

Accordingly the association was reorganized, a second nurse was appointed to coöperate with the first, and the work was put on a more practical basis by the appointment of the following committees:

1. *Finance Commitee:* (a) To receive membership fees and raise money by other methods; (b) To keep proper account of finances, and prepare annual report.

The coöperation of all the other committees is required for the successful carrying on of the finance committee's work. It is wise where possible to secure the help of the nurses, as their daily contact with the patients gives the work a human interest.

As a proof that the civic authorities here are beginning to recognize their responsibility, the City Council has, during the past year, granted the above committee $50.00 per month toward buying supplies for needy patients.

2. *The Education Committee:* (a) To procure and distribute literature; (b) To secure suitable public speakers from time to time; (c) To prepare and give health talks in schools and churches; (d) To keep facts before the public, through the press and in other ways.

In this case, the education committee is also a publicity committee and this part of the work is urgent. Stories and cartoons may be kept running in the daily papers with good effect, and bulletins also have their value. In our association, through the kindness of the daily papers, a report of the work done by both nurses is published at the end of each month. So many social activities come to the public for support and interest, that we must also present our case and abide by the verdict. With us, too, much is made of the annual meeting. Full reports are prepared, interesting lantern views shown, and some special features arranged to attract a good attendance.

3. *Supervision Committee:* (a) To have oversight of work of nurses, meeting monthly for receiving of reports and discussion of plans; (b) To have purchasing of all supplies, including nourishment, medicines, sputum cups, cots, clothing and tents where necessary; (c) To secure and maintain a room as headquarters, where supplies may be kept; (d) To keep in touch with conditions as found by the nurses in the homes they visit.

It has been said that the cornerstone upon which the most effective nursing has been built is adequate supervision, and while a committee such as the above often renders excellent service in supervision, still their time is necessarily limited, and the aim should be to put the work of the nurses under a special supervision as early as possible. If the association engaging the nursing sisters cannot do so unaided, an affiliation of various societies might together be able to afford such a supervisor.

A well-known central place should be chosen as headquarters, as this will give dignity and importance to the work and enormously increase its usefulness. Thus, under the three headings of finance, education and supervision, the work has since been carried on, and while necessarily imperfect, still much good has been accomplished, and many new avenues of usefulness have been opened up.

For example, it was found that many cases of disease in children were not being reached by either of the visiting nurses, so in the following year a school nurse was appointed by the Board of Education. Since that time there has been gradually developing a system of coöperation among the three factors—the Medical Health Officer, the School Nurse and the Health Association, whereby children reported by the School Nurse as requiring nursing care are reported to the Health Association and by it put under charge of the Visiting Nurse.

On the other hand, contacts in tuberculosis homes, and children who should not be mingling with other children, are reported to the medical health officer and steps taken to isolate such cases.

In regard to tuberculosis among children, it is significant that more and more attention is being put upon this phase of the work, and we are beginning to see that the key to success in combating this disease lies in proper preventive work among children.

McCleave says: "It is now generally conceded that infection with the tubercle bacillus is, in the majority of cases, an incident of early life, and that regardless of the time of development of clinical symptoms, tuberculosis is, in its origin at least, essentially a disease of childhood."

Dr. Baldwin, of Saranac Lake, also says: "Childhood is the time of infection, youth the time of super-infection, and that from the extension of the primary disease."

The nature of work along preventive lines undertaken in various cities will vary largely according to local environment.

During the summer of 1914, our association made a beginning in preventive work by establishing a Day Camp for Children.

Those allowed to attend were children having inactive, incipient tuberculosis, contact cases, and those who were under-developed because of the lack of nutrition.

The site of the camp was a large, natural park with plenty of room, and with a creek running through, which afforded an excellent paddling place in warm weather. A trained nurse was in attendance, and a cook was secured to prepare the food. The children were called for in the morning by a bus, and returned to their homes in the evening.

On their arrival at the camp they were given a light lunch, then under the supervision of the nurse, they played about for a couple of hours. At noon a good, substantial dinner was served, consisting of meat and potatoes, an extra vegetable, and a nourishing dessert of some kind, with plenty of milk to drink. Immediately after dinner, the children all rested quietly for about two hours —some sleeping, The rest was taken in a huge tent with cots supplied with mattresses. Then more play was indulged in before it was time to have their afternoon lunch and go home.

Practical instruction in personal cleanliness was given by the nurse, each child being provided with a basin for washing, towel and tooth-brush. It is noteworthy that the venture was started without funds, but as it served as a demonstration of the necessity of such work, interest was soon aroused, and donations made in various ways sufficient to keep things running. On the outbreak of the war, however, it was found necessary to suspend the work of the camp, but we are looking forward to reopening it, and also to extending this phase of the work to include open-air rooms in our schools.

However, preventive work can never reach its highest efficiency as long as advanced cases are allowed to be sources of contagion.

Francine says: "It is largely children infected by contact in their homes, who furnish later the ever on-coming crop of consumptives."

At present, in Ontario, it is the duty of physicians to report all cases of tuberculosis to the medical health officer. If this is rigidly carried out, even those cases which have no regularly attending physician should be known to the medical health officer, and steps should be taken to see that such patients are not, or do not, remain a source of contagion. In many cases, removal to institutions for their care may be necessary, or where there is no sanatorium or hospital accommodation available, the services of the visiting nurse will likely be required.

Now, before closing, just a few words as to the most important factor in all this work—the visiting nurse.

As far back as twelve years ago, Dr. James Alexander Miller wrote: "It is certainly true that a woman trained in nursing, who has the energy, interest and ability necessary for this kind of work, can do much more than any physician towards ascertaining the exact conditions of affairs, and correcting the evils existing in the homes of tuberculous patients. In no other way could this work be at all complete or satisfactory to the physician, to the patient, or to the community, and that these patients themselves appreciate this fact is evidenced by the warm reception given to the visiting nurse as a friend and welcome visitor in their homes. We consider her as an indispensable factor in the correct solution of this problem, and as a result of her efforts we can at least say that each case visited is converted from a dangerous focus of infection into a source of accurate and intelligent knowledge in regard to this disease."

Dr. Miller's summing up of the situation has been the experience of many another pioneer worker during the succeeding years.

The work of the visiting nurse has since then grown in scope and usefulness, and all other contributory factors, such as institutional care, dispensaries, educational propaganda and increased knowledge regarding hygiene and sanitation, have reached their highest point of usefulness through her coöperation.

If I were to set down from the physician's standpoint the necessary requirements for an efficient visiting sister, you might say my ideals were too high, but as few enter the field for the monetary reward, it is safe to say that in the majority of those who volunteer for such work, is necessarily the first great essential—a love and sympathy for suffering humanity, a desire to better conditions and bring peace and happiness where turmoil and misery now exist. But with this sympathy must go ability, character, tact, energy and education.

Added to these womanly qualities must also be professional ones, and an untrained, unskilled worker would be next to useless. The efficiency and skill which comes from a good, regular hospital training are invaluable. But even for the woman highly endowed with splendid qualities, to which are added the professional nurses' training, there is a further education necessary to make her work most effective.

I speak of the training or experience which gives familiarity with the material with which she is to work, with the lives, character and habits of the poor in their homes, knowledge of general housing conditions, and of conditions which predispose to disease.

Further, to be able to be most successful, she should be familiar with all agencies intended to prevent or right these conditions, such as knowledge of public law, the benefits which come from schools, churches and charitable societies, and also with agencies provided for direct relief of sick, such as dispensaries and hospitals, sanatoria, etc.

Now just a word as to results. Do not expect too great or too speedy results. Some communities will respond to efforts made more quickly than others, but as sure as seed will grow in proper soil, just so sure will results be forthcoming from honest effort.

It is a rule as old as the world, that nothing is born without travail, and through toil and weariness, self sacrifice and often disappointments in such work as this, is being born the modern development of charity and medicine.

"Charity," as Dr. Devine says, "in this newer and better sense, endeavours to discover and to abolish the untoward conditions which undermine health and destroy life, which make rational living impossible and embitter honest toil, helping those who fall by the wayside, but having for its best objective point the removal of the ultimate causes of such downfall."

To coöperate in such a noble endeavour is the privilege and reward of the visiting nurse, and with such coöperation ultimate success is assured.

FALLACIES IN THE LOCALIZATION OF FOREIGN BODIES BY THE *X*-RAY

By W. H. Eager, M.D.

Captain, C.A.M.C.

THE object of this paper is not to advance any new theories regarding the location of foreign bodies but rather to point out the fallacies which occur, and the need for coöperation between the surgeon and radiologist before and at the time of operation. I must apologize for my paper which has been most hurriedly prepared, owing to the extra work incident on the opening of the *x*-ray department at M—— Barracks Hospital.

I shall first demonstrate the methods of localization commonly employed.

The first and simplest method is that of taking two views of the part, an antero-posterior, and lateral. This gives a rough idea of the location. I found this method necessary in a large majority of the cases which were examined in France owing to the necessity for speed on the arrival of a convoy. In fact the surgeons could hardly wait until the plate was fixed, let alone dry. In order to facilitate the finding of the body I used a rule with metal points; this left the marks on the plate, and the surgeon could see how many inches above or below a joint or mark was the projectile.

The next method of localization is by stereoscope. In this the tube is moved the pupillary distance, about 2½ inches. Two plates are taken which, when examined in a stereoscope, give the sense of distance and proportion. It is a very useful method, in fact the best in wounds of the torso. It requires an expert to interpret the stereoscope, but when done properly one is able to say that the foreign body is within the thoracic cavity or outside, and its relation to a rib or other bony structure. The method is also of use in examination of the cranium.

The third method is the Mackenzie-Davidson or some modification of it. This method is based on the constant line of travel of the *x*-ray from a tube which maintains its vacuum. A plate is

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used having inked cross wires at right angles to the centre of the plate. The tube is centered on the cross wires at a fixed height, 50 cm. being the usual distance, and is held in such a position that it can only move parallel to and over one of the wires. The limb to be examined is then placed on the plate and held in position. It is better to have a marker on the skin somewhere near the foreign body. The point of entrance of the *x*-ray is then marked on the skin after which one exposure is made. The tube is then moved a certain distance, 10 cm. being the best, and another exposure is made on the same plate without moving the plate or patient. In this way we secure two images of the foreign body and marker on the plate as well as the cross wires. The marks of the cross wires are left on the skin, and are made more permanent by painting over with 20 per cent. solution Argent. Nit. From the two shadows obtained we are enabled to calculate the depth of the foreign body from the plate. This is done either by calculation, logarithm scale, or by actual measurement with the apparatus which I shall show you. By this method we are able to tell exactly the position of the foreign body and were all our parts square, as cubists and futurists would have us believe, then the location of the fragment would be a very simple matter to the surgeon.

I shall now mention the fallacies, and offer a few suggestions to make the surgeon's work less arduous

Common Fallacies. The greatest difficulty which confronts the surgeon is the position of the part on which he is about to operate. Example: a patient is posed for examination with the posterior aspect against the plate, with the limb in, as nearly as possible, a true, antero-posterior position. The foreign body is near the plate. When the surgeon operates he must place the limb in the postero-anterior position which, even if exact, has necessarily caused a change in the position of the muscles. As a rule the metal is within the muscle substance and subject to movement with it. This error is particularly apparent where the metal lies in the vicinity of the shoulder girdle, where a change in the position of the arm affects the relation of all the parts.

Distortion. The *x*-rays being divergent from the focal point on the anti-cathode of the *x*-ray tube, and not parallel, distortion will naturally take place. This leads to the foreign body invariably appearing larger than normal and this is more marked the farther the metal is from the *x*-ray plate. It is also projected and never appears in its actual position unless it is directly under the principal rays of the tube. This projection may be so marked as to throw the particle outside the limb on the plate, or, if the plate is too small, completely off the plate when there is, apparently, no foreign body present. Due allowance must always be given to this distortion when operation takes place.

Compression. As the parts are soft the weight of the part pressing on the plate makes the image appear nearer the surface than it really is.

Fallacies in the two-view method. In this method the principal difficulty is to get a true antero-posterior and lateral view, the slightest rotation of the limb will distort the picture, and give a false impression to the surgeon. I have had a box constructed which will allow of two views being taken at right angles without moving the limb. This is of especial value in those cases which cannot be removed from the stretcher.

Stereoscopic. The difficulty in actual location by this method is that actual distance from any given bony point has to be gauged by the eye of the radiologist.

Mackenzie-Davidson. The fallacies in this method are those common to all. Though the method is exact, the difficulty of operating on a round or oval body with consequent angular errors in incision is still to be reckoned with. I have here a few diagrams to show how difficult it is to keep one's incision parallel to the marking lines.

Depth. It is always to be remembered that the depth is that from the plate and not from the skin, and allowance must be made for this distance. The element of compression is most important in this method of examination as the depth given by the radiologist is that calculated while the limb is under compression. Unless the part is in the exact position in which the examination was made, or the exact reverse of that position then the error will be very great.

We now arrive at the question, how are we to overcome these errors? Errors on the part of the radiologist can only be overcome by the greatest care on the part of the expert radiologist, whose apparatus must be most exact, and carefully constructed.

Fixed positions and anatomical landmarks should be adhered to in his examination, and due note taken of them.

The radiologist should always be present at the time of operation to advise the surgeon regarding the point of incision and course to follow.

Examinations should be made shortly before operation in order that the case is fresh in the minds of both surgeon and radiologist.

The use of some apparatus in order to show the right angle lines of exposure. I have here a roughly constructed piece of apparatus which I trust to have manufactured so as to be of serivce.

As we are dealing with round or oval objects, and as the cranium is the most important portion of the anatomy on which we have to operate, I will detail the procedure on the part of the radiologist which I consider necessary before operation is undertaken for the removal of a foreign body. I may say that in a large number of such cases I have seen an immense amount of damage done to the brain substance without the foreign body being discovered.

The head should first be screened in order to get some idea of the location of the foreign body. An antero-posterior and lateral examination should then be made, following this a stereoscopic examination with the part nearest the foreign body next to the plate. Cross wires should be placed around the head following Reid's base line and over the head from external auditory meatus of one side to that on the other side. This gives a sense of distance proportion and location of the mass to the brain substance. After this has been done we do a Mackenzie-Davidson localization having the part nearest the foreign body (irrespective of the position in which the head had to be placed) next the plate. The point of entry of the principal ray at the first exposure should be marked in this and all cases. Thus you see I have made five plates of the head before I feel confident of the exact position. It is now up to the surgeon to find it.

I would like to mention how invaluable the needle with microphone attachment is. By its use much laceration of the part is avoided.

A MEETING of the National Executive Committee of the Patriotic Fund took place at Ottawa on December 7th, under the chairmanship of His Excellency the Governor General. It was reported on that occasion that the total contributions to the Fund up to November 30th amounted to $16,615,778, an amount exceeding the total expenditure incurred up to that date by about three million dollars.

Editorial

ON THE SEGREGATION POLICY

WHILE it is one of the grave disadvantages of a monthly journal that matters of note may transpire and come to a head weeks before the journal can take note of them, there is the corresponding advantage possessed over the daily papers that a such monthly journal may take cognizance of these matters less hurriedly, and in a more judicial manner.

A few weeks ago Great Britain, and Canada also, were roused by a strongly worded letter published in the *Times* under the signature of Lady Drummond, protesting against the segregation policy initiated by the late Minister of Militia and Defence with respect to Canadian military patients in England. It was a well reasoned protest written with masculine directness by one who, from her position in connexion with the Canadian Red Cross, was singularly well qualified to speak with authority, and it was followed by a succession of letters in the same well-known and influential daily.

What, it may be asked, are the facts that have been brought forward, and what should be the Canadian policy in this matter? Is it the more economical and the better policy to treat Canadian military patients apart from other British military patients, in special Canadian hospitals, or is it on the whole advisable to regard and administer the Canadian Expeditionary Force as a portion of the British Expeditionary Force, and to deal out to Canadians the same treatment as is meted out to Irish, Scottish and British soldiers returned wounded to England?

There are three aspects of the case, namely, from the point of view of economy, of military administration, and of the well-being of the invalid.

For economy there is the following to be said pro and con. The system of hospitalization in England had been well worked out, each District and larger Military Territorial hospital having a system of subordinate Voluntary Aid hospitals under its supervision. But previous to the War the system had existed only on paper, and it was found that while it was put into effect with singular ease, the absence of previous experience led to very serious defects. These were not so notable in the larger Military hospitals under the charge of trained Army officers and possessing clerical staffs, but were glaring in connexion with the numerous V.A.D. hospitals. These are voluntary organizations run by groups of devoted women, local practitioners attending the patients admitted. Now the only way to keep track of patients admitted to these hospitals is by the regular forwarding of returns of admissions, transfers and discharges to the central hospitals and from these to Headquarters. It can easily be pictured how for long months the provision for such returns was more honoured in the breach than in the observance. These V.A.D. hospitals had no clerical staff; the kindly women who ran not a few of them had not the first idea either of the use or the necessity for such returns. Returns meant stamps; they regarded them as a wicked waste of time and energy and money. Thus when in 1915 Canadian patients began to be distributed about England, large numbers of them absolutely disappeared for weeks and months. The kindly V.A.D. people had taken them into their charge, they treated them with especial consideration, in fact as their very own; they petted them as they got better and thought nothing of keeping them for an extra month or two because they were Colonial cousins. In order that they might obtain full strength they sent them as convalescents to private houses throughout the country, or to local Convalescent Hospitals. The instructions to transfer them to Canadian Convalescent Hospitals were cheerfully ignored. They made no reports about these various movements: they did not answer letters of inquiry. Presently the men were struck off the lists as deserters, only to turn up weeks later in perfect innocence, and it required unending official correspondence before they could be properly re-instated. In the meantime V.A.D. institutions sent in their monthly accounts to the district paymaster: these were returns for capitation allowance for the upkeep of the men and returns of an importance that was fully appreciated by the V.A.D. ladies, and eventually the Canadian authorities have to pay for the keep of their men for all these unnecessary weeks, not to say months.

This is one side. On the other it must be remembered that these men had been kept in already existing institutions, in hospitals, schools, public buildings, large country houses, etc., for which there is no rent to pay, that the V.A.D. nursing and much of the equipment are given voluntarily, and that thus the cost of the Canadian private in England in a British hospital is only 75 cents per diem. This is an absurdly small sum. With practically every suitable building in Great Britain already occupied, the Canadian authorities, if they carry out the policy of segregation, would have to place the majority of the Canadian patients now in Great Britain—and of late there have been 20,000 such—in hutments. The establishing of these hutments at the present cost of material would for building alone cost the Dominion somewhere near $200.00 per bed not to mention the additional cost for bedding, equipment and service. There would thus be an initial expense of millions of dollars and at the end of the War the huts, beds, bedding, and apparatus would be thrown back upon our hands. It is safe to say that the cost of upkeep per individual would, taking everything into account, be over $1.50 per diem. In addition there would in all probability be a heavy bill to be paid wherever these hutments were placed, for demolition, and restoration of the various properties to their original state and use. Added to this, the V.A.D. hospitals have with fuller experience come into line, and returns are now being well looked after by the central hospitals, while so big is the strain upon the British hospital system that soldiers, British and Canadian alike, are being passed on to duty without delay. All Canadian soldiers now, when convalescent, are transferred to Canadian Convalescent hospitals, and the system is worked without friction and with thorough efficiency. It is clear that the cost to Canada of establishing separate Canadian hospitals for active treatment would exceed the cost of the system that has been in vogue up to the present. In other words the suggestion is absolutely uneconomical.

Next as to military administration. Any one who has seen the disembarkation of a great hospital ship at Southampton cannot but marvel at the celerity and precision with which in the course of a few minutes ambulance train after ambulance train draws up, is filled with patients, and departs to one or other district of England. As far as is conveniently possible, in order that they may be near their people men of Irish battalions are sent to Ireland—Scottish to Scotland, Yorkshire men to Yorkshire and so on. Up to a certain extent Canadians might be distributed to Canadian hospital districts. It is questionable, however, whether the majority of Canadian soldiers would desire this, and that because the majority, over 60 per cent. are (or were before the 4th division reached England) of old country birth, with old country connexions. They would, many of them, prefer to be near their relatives. To obtain complete segregation and to arrange that Canadian patients are sent *only* to Canadian hospitals would mean that each hospital ship must contain a sufficient number, and no more and no less, of Canadian patients to fill one or more ambulance trains for distribution to the Canadian Hospital district or districts. This idea logically carried out would mean that Canadian patients must be collected in Canadian hospitals in France. For this to be practical, there must either be special Canadian hospital ships, or periodically British hospital ships must be provided to transfer the collected Canadian patients. Now for Canadian General Hospitals in France to be devoted entirely to Canadian patients, as it would seem was seriously recommended in the confidential report compiled by Colonel Bruce, must mean either that when Canadian troops move south, as they have done recently to the Somme district, then the Canadian General and Stationary Hospitals must similarly move south to some point or points along the existing lines of communication, or that the hospitals remaining where they are, Canadian patients must be brought up from the south across the main lines of communication. This is as much as to say that Canadians must have their own lines of communication separate from the British. The idea is a preposterous one. The cost to the Dominion Government of carrying it out, i. e., of establishing independent Candian lines of communication, or of dismantling and re-appointing hospitals of 1,200 to 2,500 beds, each time that the C.E.F. moves its position, of establishing a service of Canadian Hospital ships, etc., would be stupendous. Simplicity of administration demands that the present system be maintained.

Lastly as regards the patient and his interests. Is it wise, viewed from the interests of the Canadian patient, that he should be treated along with other Canadians, by Canadian nurses and medical officers in a Canadian hospital, rather than that, as at present, the chances should be nine to one that he should find himself instead in a British hospital side by side with British Tommies, and treated by British doctors and British nurses? Here, admittedly, we encounter the greatest difficulty in coming to a decision. Upon consideration there are several quite distinct ideas, all connected, it is true, with the well-being of the Canadian soldier. If we enquire "Will he be better cared for in a Canadian or in a British Hospital?" we include in the question enquiry both as to professional treatment by doctors and nurses, and what may be termed human treatment —feeding, entertainment and companionship. If we ask

"Will he have a better time?" we similarly have in our minds ideas of bodily and mental comfort, as well as of military discipline and the wise degree of relaxation of the same. It is difficult if not impossible to weigh all these matters fully within the limits of a page or two.

This, however, may be said, that throughout the British Expeditionary Force overseas in Europe, Canadian hospitals, whether in Egypt, in Salonica or in France, have a splendid reputation: men—and officers too—of British battalions think themselves lucky to be admitted into one of them. The report has gone around that the medical treatment is of the best, the nurses splendid and not "standoffish," the food good and plentiful, and that military discipline is relaxed to a proper degree. At the seat of war the ordinary soldier has no voice in his disposition as a patient. The ambulance train bears him he knows not whither. It is not a little gratifying to us as Canadians to hear of a spontaneous cheer passing along a line of ambulance waggons filled from an ambulance train fresh from the British front upon the news being vouchsafed that their occupants were destined for one of the Canadian General Hospitals somewhere between Le Tréport and Boulogne. This, surely, does Canada no harm.

Could we promise to afford the same superiority were we to establish Canadian hospitals for the active treatment of 20,000 men in England? We doubt it. The best British hospitals in England are quite equal to the best Canadian in every respect—say to the Duchess of Connaught Red Cross Hospital at Taplow or the Ontario Hospital at Orpington. And save for specialists our best and most active surgeons and physicians seek to be, and what is more, have the influence to be, at the seat of war where they think they can be of greater immediate service. Inevitably the pick of the profession and of the nursing staff —those with the fullest military training—are at the seat of war, nor could any large proportion of these be brought back to staff hospitals in England without on the whole doing more harm than good. The supply, that is, of officers of the Canadian Army Medical Corps of the first order, is not illimitable. Nor would the new hospitals possess the independent funds which have been donated generously to the great overseas hospitals. It is doubtful, therefore, whether what may be termed the average professional treatment accorded to our Canadian soldiers, were they segregated in Canadian hospitals in Great Britain, would be superior to what is obtainable at the moment.

Next as to comfort, entertainment and interest. There can be no question that a Canadian soldier who finds himself in a British hospital obtains more attention from the good people of the neighborhood than he would were he one of a large number in an exclusively Canadian hospital in some district in the south of England. For administrative purposes the Canadian hospitals for active treatment would have to be in groups close together. The attention lavished upon Canadian invalids under present conditions is very remarkable; the interest taken in them personally as colonials, the entertainments to which they are invited, the motor drives and other personal attentions would be almost entirely wanting were Colonel Bruce's recommendations carried into effect. It may be asked whether these attentions are good for the men? On the whole we think they are. But what we think is still better is the opportunity given to the Canadian soldier to become acquainted with men from British and other Colonial units. It must be remembered that, after all, the Canadian Expeditionary Force occupies but a very limited few miles of the Front, and that month in and month out the Canadian soldier fraternizes only with other Canadians; that at the Front he knows practically nothing save what is happening in his own particular area, and not very much about that. To mingle in the general hospitals with men of various other units gives an extraordinary education. The knowledge possessed by the ordinary British Tommy of the history of his regiment—and of the weak points of other regiments—is very striking. Spending day after day in the general ward one learns the history of the British Army, the history of the present war, all along the front, and comes to appreciate humanity. Such a general ward affords a university education and must broaden a man in a way that it is not possible when he remains segregated with his own people. From what we learn the Canadian "Tommy" so placed is not backward in extolling the virtue of his own country and people, and in acting as an emigration agent.

There is, however, the other side of this subject. Under the old order of affairs, an isolated Canadian might easily find himself distributed to some small hospital having from a dozen to twenty beds, situated in some dreary manufacturing part of England—say one of the industrial suburbs of Sheffield or Oldham,—with no one around him having any knowledge of Canada, or interest in his home concerns and people, no one with whom to swap stories, no one having interests in common: such a man might find himself absolutely isolated and miserable. There have been such cases, but enquiries addressed to the Chaplains at the Canadian Convalescent Hospitals to which all the patients are returned—addressed, that is, to officers who come intimately into contact with the individual invalids—reveals that these cases are distinctly rare, and what is more that the men who have experience of that kind are most often constitutional grumblers who would have been discontented under any conditions. According to statements made by these Army Chaplains, the men with rare exceptions speak in the highest and most grateful terms of the treatment they have received, whether this has been in large central military institutions, or in one or other of the numerous little V.A.D. hospitals scattered throughout the land. We are convinced thus that the complaints made in the "confidential report" are greatly exaggerated.

Nevertheless we confess to sympathy with the man who would like to see around him those who are not entirely strangers, and there is a *via media* which will do away with practically all the difficulties of the present situation. Curiously enough this is not suggested, even in the "confidential report", although it must have been well known to Colonel Bruce and his Board of Enquiry, and this is what may be termed the Australian procedure. The Australians encountered the same difficulty, and to overcome it they arranged with the War Office that Australian soldiers while distributed through English hospitals, should only be admitted in groups of six or more, thereby ensuring that none of their men should be isolated. If along with this the appointment of a band of Canadian medical inspectors be made, to visit the various hospitals caring for Canadian soldiers and to report whatever professional and other conditions are not satisfactory, the situation would be well met without its being necessary to introduce the scheme recommended by Colonel Bruce, a scheme which in our opinion is as impracticable as it is costly and wasteful. It deserves note that this system of the appointment of inspectors had been initiated by General Carelton Jones, although not carried to its proper fulness long months prior to the appointment of the Board of Enquiry.

Thus it cannot be recommended that there be further extension of Canadian General Hospitals for active treatment in England. We hold that those already in existence are quite sufficient, save that where Canadian camps are established or troops collected in England, it is quite proper that general hospitals be established for the care of the local sick among our troops. There is nothing to be said against the establishing of new hospitals at Shoreham and Brighton somewhat like the Canadian General Hospitals at Shorncliffe and Bramshott, that is, if the local accommodation be found inadequate. The Duchess of Connaught Hospital at Cliveden, and the Ontario Hospital at Orpington have been given for the use not of Canadians only, but for the whole Expeditonary Force, and may well be continued along the original terms of gift.

The establishment of special hospitals for the active treatment of particular conditions of disease comes into another category. Experience has shown that not only are certain conditions best treated by experts, but also that when so treated the period of hospital detention is materially shortened, and the number of men returned to duty is markedly increased. The British authorities were somewhat slow in realizing this, and putting it into effect. If we mistake not, the first British hospital of this nature that was accepted was that for the supply of artificial limbs at Roehampton. In the meantime the D.M.S. Canadians recognized the need, and obtained the use of the Granville Hotel of Ramsgate, the one hotel on the south coast thoroughly equipped as a hydrotherapeutic institution, establishing there a special hospital for the treatment of cases of bone, joint, and nerve cases. That hospital has been a pioneer institution, a remarkable success and a model for the British hospitals of the same order subsequently established at the Depot camps. At the same time there was established the Westcliffe Canadian hospital for eye, ear and throat cases. That, again, has filled a very distinct need. It has in fact been so successful that the British authorities are, we understand, about to establish similar institutions. The same need led to the establishment of special hospitals for venereal cases, and for rheumatoid and allied conditions at Elham and Buxton respectively. Such hospitals fill definite needs, are manned by experts, and we think nothing can be said against expanding this policy. They have a very definite *raison d'etre* which cannot be said to exist in the case of the ordinary general Canadian military hospital.

MEETING OF THE ONTARIO MEDICAL ASSOCIATION

THE thirty-seventh annual meeting of the Ontario Medical Association will be held at Toronto from May 30th to June 1st, 1917. The officers are as follows: President, Dr. A. Dalton Smith, of Mitchell; Secretary, Dr. F. Arnold Clarkson, and Treasurer, Dr. J. H. Elliott, of Toronto. Judging by the amount of work already accomplished by these energetic officers and the various Chairmen of Committees we may safely predict a meeting of more than usual interest.

Dr. Babcock, of Philadelphia, will deliver the address in surgery; in medicine, Dr. Christian, of Boston; in gynæcology, Dr. Chipman, of Montreal; and in nose and throat, Dr. McHenty, of New York. Dr. Balfour, of Rochester, has also promised to be present. These are all well-known men and there need be no assurance from us that those of our members who attend the meeting will be amply repaid.

MEDICAL INSPECTION OF SCHOOLS

ORGANIZATION, economy, efficiency, are watchwords to-day in all civilized countries as never before in the history of mankind. Among the belligerent nations it was recognized early in the present struggle how essential these are in all that pertains to military and naval affairs, and in those utilities and industries which serve them. With the enormous expenditure entailed by the war; the decreased production, the resulting high cost of living and increasing taxation, it has been found necessary to apply the same principles in a wider sphere to include the resources and activities of the nation as a whole. The necessity will be even more urgent in the economic struggle which all thoughtful people recognize must follow the war.

The interest taken in recent years in child hygiene naturally led to medical inspection of schools, and is evidence of an awakening to the national importance of conserving as far as possible the mental and physical well-being of children, upon whom the future of the nation depends.

In carrying out this commendable work a conflict of opinion has arisen as to whether Medical Inspection of Schools should be under the Boards of Health or under the School Boards. The latter in many instances were first to recognize its importance and to take the initiative, resulting later in a dual control, when progressive Boards of Health became alive to their responsibilities on the question of child hygiene.

In the administration of any work, dual control is unsatisfactory. The question therefore arises, is medical inspection of schools primarily an educational or a public health question? Sir George Newman, the eminent British authority, says, "that the problem is no longer debatable, that from the standpoint of efficiency and economy, medical inspection of schools should be under the control of the Medical Officers of Health." This is the rule which obtains in New York, Chicago, Philadelphia, Boston, Baltimore, Cincinnatti, Pittsburgh, Buffalo, Detroit, and other great American cities. The fact that Boards of Health, when properly organized, have the necessary administrative machinery, that Officers of Health have special training and experience in overseeing work of this sort, that medical supervision and inspection are equally important in their application to children *under school age*, that the work should be carried on throughout the whole year and not become inoperative in holidays, are all additional and convincing arguments in favour of school inspection being placed under the control of the Public Health authorities. This undoubtedly would be the more economical plan, and we are convinced would increase the efficiency of the work. It is therefore highly desirable that the provincial legislatures should enact legislation where necessary to place control where it properly belongs.

At the third annual convention of the Women's Institute of Western Ontario, a resolution was passed asking that a special grant be set aside by the provincial government for the purpose of providing more careful medical inspection of children in rural schools, and that further action be taken as regards the feebleminded and the prevention of admission to this country of feebleminded immigrants.

In the province of Manitoba a dairyman was recently fined fifty dollars for selling watered milk, the prosecution being conducted under the Public Health Act which provides that there shall be no appeal from any conviction under the Act. However, an appeal was brought before the provincial Court of Appeal on the ground that it was *ultra vires* for the Legislature of Manitoba to attempt to set standards for milk or cream, since such a right belonged exclusively to the Dominion Government. The Court refused the appeal, declaring that it had no jurisdiction in the matter.

The business premises and plant of the Sanatogen Company at Penzance, Cornwall, and in London, have been disposed of by the British Government. As is well known, the Sanatogen business was a German undertaking and the immense profits all found their way to Germany. The matter was taken up by the British Government soon after the beginning of the war, but it was not until last September that the business was finally purchased by a group of British business men.

Sir Charles Wakefield, Chairman of the British National Committee for Relief in Belgium, has issued an urgent appeal on behalf of two million, five hundred and seventy-five children held captive by the Germans in Belgium, the majority of whom for over two years have been kept alive by the humane intervention of the Neutral Commission for

Relief in that country. As a result of underfeeding, tuberculosis is increasing rapidly among the whole population and rickets is becoming epidemic among young children. The truth of this is borne out by the report presented by Dr. William Palmer Lucas, professor of pædiatrics in the University of California, who was sent by the American Belgian Relief Commission to study health conditions in the conquered part of Belgium. Professor Lucas states that the increase of tuberculosis seems to be mainly a result of lowered vitality due to underfeeding, that every sanatorium is overcrowded with patients and that the waiting lists for admission to these sanatoriums is rapidly increasing. On the other hand, infant mortality has decreased, a fact due to its having been the object of great solicitude since the beginning of the war.

As a result of negotiations taken up with the belligerents by the Swiss Federal Council, and the intervention of the Pope on behalf of prisoners in German camps, an arrangement was made some time ago by which prisoners in Germany who were suffering from tuberculosis or other disease and who were not hopelessly incurable should be interned in Switzerland. The first convoy of French and Belgian sick arrived at Leys on January 25th, 1916, and the first of the British prisoners reached Zurich on May 29th. Since then other convoys have arrived at Montreux, Montana, and other places. The prisoners are distributed in hotels according to their nationality. The *chef d'établissement* is an interned non-commissioned officer and the establishments in each district are under the orders of a *chef de secteur*, who is responsible to the Swiss medical officer; Colonel Hauser, physician in chief of the Swiss Army, directs the whole service. Everything possible has been done to ensure the comfort of the men and to provide them with suitable occupation. Club rooms have been provided where the men may meet and where non-alcoholic drinks are supplied at the lowest prices. Workshops have been opened in some places, a circulating library has been established, and a series of lectures arranged during the winter months. Arrangements have also been made to admit interned students to the Swiss universities.

THE American Society for the Control of Cancer was formed at the ninth meeting of the Congress of American Physicians and Surgeons, which took place in Washington, in May, 1913, and has now published a report of its activities during the three years ending May, 1916. The purpose of the Society is to institute a campaign of public and professional instruction in the symptoms, diagnosis, treatment and prevention of cancer, and to collect statistical data concerning the disease. During the period covered by the present report, the Society has enrolled 577 members and contributors, approximately half of whom are physicians. Branch committees have been formed in sixteen States and the coöperation has been obtained of a number of medical journals, medical societies, individual members of the profession, nurses, social workers, women's clubs, insurance companies, industrial and welfare organizations, and newspapers. Special articles, statistics, lectures and data of all kinds concerning the disease, are prepared by the Society and are distributed to various agencies, and public meetings have been arranged at which experts discuss the different phases of the problem. In order that the most complete statistics may be obtained, a Statistical Advisory Board has been appointed including among its members thirty representatives of organizations that were already interested in the subject. Through the coördination of all these agencies, the Board will be in a position to conduct investigations upon a larger scale than otherwise would be possible. The subject of cancer mortality has been taken up with the Director of the United States Census, and upon the suggestion of the Society a special report on the mortality from the disease during 1914 has been prepared and will be published very shortly.

Canadian Medical Association

SINCE the last number of the JOURNAL appeared considerable progress has been made in the work of preparing for the coming meeting in June, 1917.

The address in medicine will be given by Dr. Theodore C. Janeway, of the Johns Hopkins Hospital, Baltimore, and while no selection has yet been made for surgery, the names under consideration make it certain that a splendid address may be anticipated.

The committees in charge of the various sections are in communication with prominent specialists and laboratory workers throughout Canada and the United States, so that those taking part in the special branches may look forward to interesting papers and discussions.

The social side of the meeting will not receive the same amount of attention as at former meetings, as it is felt by the Executive that this should be largely a business and scientific meeting. At the same time one or two functions at which the members may get together and renew old acquaintances are being planned.

THE medical curriculum has been shortened to four years and eight months in all Australian universities for the duration of the war in order to increase the number of graduates in medicine to meet the military and civilian requirements.

Miscellany

Book Reviews

S. Weir Mitchell, M.D., LL.D., F.R.S., 1829-1914, Memorial Addresses and Resolutions. Philadelphia, 1914.

To have emerged at the end of a long life of usefulness, to have ridden over all the disappointments and trials of daily happenings, and, notwithstanding all the anxieties personal and professional of an existence so varied as that of the late S. Weir Mitchell, yet to be able to produce such happy and uplifting Essays collected in this delightful volume, is a record that falls to the lot of few men in active work in any of the professions. It is difficult to express what the world at large owes to S. Weir Mitchell, but this may well be said, that his memory will be ever green in the work before us, recalling on every page a very charming personality. R. W. P.

Collected Papers on Analytical Psychology. By C. C. Jung, M.D., LL.D., formerly of the University of Zurich. Authorized translation edited by Dr. Constance E. Long, Medical Officer, Education Board. 392 pages. Publishers: Baillière, Tindall & Cox, 8 Henrietta St., Covent Garden, London, 1916. Price 12/6 net.

The papers constituting this volume are chiefly lectures delivered in Great Britain and America, together with a few reprinted articles arranged chronologically. They embrace a variety of subjects, such as the psychology and pathology of the so-called occult phenomena, the psychology of rumour, psychoanalysis, the psychology of dreams, the content of psychoses, and cognate matters—all in the field of the newer psychology which is in the making. Those who have followed this later trend of thought, beginning especially in the work of Freud, will not need to be told that Jung's thinking is critical and original, and it may please those antagonistic to Freud's views to know that Jung disagrees with the Vienna school in certain fundamental conceptions, being "synthetic and prospective" rather than "analytical and causal merely.

The latter, at least those of them who desire enlightenment, can profitably read this collection of masterly writings. The method of presentation is most eminently fair and scholarly, and is characterized by a careful balance of statement, well exemplified in the correspondence with Dr. Loÿ here published. This is as it should be; most so when the materials of study are found in the realm of the unconscious—which is the quaking foundation of individual mental life. To many the unconscious is a fearsome thing. But the fact is established that therein lie the hidden springs of many actions and behaviours, and if we are to know ourselves, fearless study must be undertaken. Dr. Constance E. Long, to whose care has been intrusted the editorship of the volume, well says that "we must learn to use this knowledge and in using it to submit to its own laws."

The book will be a necessary part of the library of every neurologist.

THE PROBLEMS OF PHYSIOLOGICAL AND PATHOLOGICAL CHEMISTRY OF METABOLISM. For Students, Physicians, Biologists and Chemists. BY DR. OTTO VON FURTH, professor extraordinary of applied medical chemistry in the University of Vienna. Authorized translation by ALLEN J. SMITH, professor of pathology and of comparative pathology in the University of Pennyslvania. 667 pages. Philadelphia and London, J. B. Lippincott Company, 1916.

THE translation of this book will be welcomed by all those who have at heart the welfare of biochemistry and its applications to medicine. The book is more than a mere compilation of facts, which the medical student or the practising physician reads, and remains at the end almost as wise as he was at the beginning; a statement which unfortunately can be made of many text-books on this subject. As such it fills a distinct gap in the English literature. It presents metabolism as a connected subject. It shows the practical bearing of biochemistry, not merely as a series of diagnostic tests, but as an attempt to unravel the mysteries of human metabolism, and so lead to a clearer and more rational treatment of disease. This is admirably shown in the chapters on purine metabolism. It also emphasizes the importance of thorough research, not only by the chemist and the physiologist, but by the medical man, and in this connexion, indeed, von Furth has some severe strictures to lay on certain types of original work.

Like all translations the book suffers a little in not being quite up to date. The date of the German edition is not given, but judging by the references is 1912. It is unfortunate, too, that the translator has made several mistakes in chemical nomenclature. Thus "nitric" is written for "nitrous" (p. 120); pyruric acid is called "racemic acid" (p. 460); d. galactose (dextro-rotatory) is given as "δ galactose," which would be an entirely different, and as yet unknown, form of that sugar (p. 290), etc.

These mistakes, however, do not mar the value of the book and we can recommend it to all those who wish to gain a generalised knowledge of this branch of chemistry and medicine. The value of the book is increased by numerous references to the original articles.

INFECTIONS OF THE HAND: A GUIDE TO THE SURGICAL TREATMENT OF ACUTE AND CHRONIC SUPPURATIVE PROCESSES IN THE FINGERS, HAND AND FOREARM. BY ALLEN B. KANAVEL, M.D., assistant professor of surgery, Northwestern University Medical School, Chicago. Third edition; thoroughly revised. 498 pages with 161 illustrations. Lea & Febiger: Philadelphia and New York, 1916. Price $3.75 net.

Kanavel's book deserves not only this third edition but many other editions. It has been very favourably reviewed everywhere and deserves every commendation. It is a model of the monograph. In the present edition the author has taken the opportunity of adding two chapters, the first upon the relation of acute infective processes to industrial pursuits, and the second upon plastic procedures instituted for the correction of deformities. The great part of the first of these appears to have been written by Dr. Mock, in collaboration. It sets forth briefly the enormous importance from the economic standpoint of the early and thorough treatment of the minor injuries to the hand in workmen. Statistics are given indicating the very great loss in time and in working power resulting from the infections of these minor injuries when neglected.

The work of Dr. Mock, and of a few other surgeons whose work lies largely in industrial concerns, has of late years made it evident to employers how important it is to guard against the numerous external causes for accidents found in working places. These men have been largely responsible for the spread of the "safety first" movement through America and Canada, a movement which has done so much to lessen accidents.

Dr. Mock is very strongly in favour of hospital treatment even for small injuries as against ambulatory treatment, and proves his point by an appeal to figures.

The second chapter, added to the present edition, concerns Dr. Kanavel's experience in plastic operations for those serious late effects of hand infections, particularly atrophy and contracture of muscles, ankylosis of joints and involvement of arteries and nerves in scar tissue with secondary atrophic changes. On the whole his results in these desperate cases have been most encouraging. Considerable improvement was secured particularly by transplants of fat about tendons, nerves, and into the space left by the excision of the carpal bones.

There is also to be noted a distinct improvement in many of the illustrations. In conclusion one can only advise most strongly all medical men who have anything to do with hand infections, to buy this book and to study it carefully. There are few things so frequently mishandled as these infections, and there can be but few practitioners who will not profit by a study of the book.

THE ART OF ANÆSTHESIA. By PALUEL J. FLAGG, M.D., lecturer in anæsthesia, Fordham University Medical School, anæsthetist to Roosevelt Hospital. 341 pages with 136 illustrations. Philadelphia and London. J. B. Lippincott Company, 1916. Price, $3.50.

Dr. Flagg's book is entitled The Art of Anæsthesia. This is not to say that the scientific side is altogether neglected, but essentially it is a book which goes particularly into the detail of the anæsthetic art. It is intended to instruct the student and the graduate how to give anæsthesia pleasantly and safely. All forms of anæsthesia as practised to-day are well described, and in so far as it is possible to give instruction in anæsthesia Dr. Flagg does it.

There is at the beginning a good, though short chapter on the history of anæsthesia in which due credit (so long delayed in the paying) is given to Crawford Long for his discovery of ether. The administration of ether is, as is right, described most fully, that being nowadays our standard anæsthetic.

Chloroform is judged severely on account of its dangers of sudden death and chloroform poisoning, now so well known; but no mention is made of the various apparatuses, such as the Vernon Harcourt, for giving low percentage chloroform, the results with which have been so very much better than with the ordinary administration.

The chapters on intra-tracheal and intra-pharyngeal ether are well done and up to date; and the same may be said of the chapter on gas-oxygen anæsthesia. The author makes the very just observation that in the combined gas-oxygen plus local anæsthesia, the local is decidedly the more important of the two. He also points out the value, and indeed the frequent necessity, of the addition of ether to the ordinary anoci-association technique of Crile.

The chapter on regional anæsthesia is far too short considering its growing importance. The theory of anæsthesia, by which we mean the physiological and pathological side of the subject, is not in this volume discussed at any length. That, however, belongs more to the science of anæsthesia which this volume does not propose to discuss at any length. In conclusion, the book may be heartily recommended to students and to beginners, though it contains many hints also which may be of value to the professed anæsthetist.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

Pharmacology abd Therapeutics. By Horatio C. Wood, Jr., M.D., professor of pharmacology and therapeutics in the University of Pennsylvania. Second edition. Publishers: J. B. Lippincott Company, Philadelphia, London and Montreal, 1916.

Syphilis. By Loyd Thompson, Ph.B., M.D., physician to the syphilis clinic, Government Free Bath Hospital. 415 pages with 84 illustrations. Publishers: Lea & Febiger, Philadelphia and New York, 1916. Price $4.25 net.

Physician's Visiting List for 1917. Sixty-sixth year of its publication. Publishers: P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia.

A MANUAL OF CHEMISTRY. A Guide to Lectures and Laboratory Work for Beginners in Chemistry. A Text-book specially adapted for Students of Medicine, Pharmacy and Dentistry. BY W. SIMON, PH.D., M.D., late professor of chemistry in the College of Physicians and Surgeons of Baltimore; and DANIEL BASE, PH.D., professor of chemistry in the Maryland College of Pharmacy. Eleventh edition, thoroughly revised. 648 pages with 55 illustrations. Publishers: Lea & Febiger, Philadelphia and New York, 1916. Price $3.50 net.

THE BIOLOGY OF TUMOURS. BY C. MANSELL MOULLIN, M.A., M.D., F.R.C.S., Lt.-Col. R.A.M.C.; consulting surgeon to the London Hospital. Publishers: H. K. Lewis & Co., Ltd., 136 Gower St., London, W.C., 1916. Price 2/6 net.

Obituary

ANDREW ROBERTSON GORDON

DR. A. R. GORDON died at his residence, 73 De Lisle Street, Toronto on Sunday, December 17th, 1916, after an illness which lasted for more than a year.

His death at fifty-three years of age will be a source of keen regret to his many friends. He enjoyed the confidence of a large number of the citizens of Toronto who sought his service as physician and his ability as a teacher won the admiration and respect of the many students who of recent years have passed through the University of Toronto in the Faculty of Medicine. Patients, students and colleagues at the University will mourn his loss and have heard of his death with great sorrow. None will grieve more sincerely than his former fellow officers at No. 4 Canadian General Hospital with whom he went on active service abroad in May, 1915.

Dr. Gordon graduated in medicine from the University of Toronto in 1890. He was eminently successful in his profession and acquired a very large practice: of late years he restricted himself to the work of a consulting physician, specializing more particularly on diseases of the heart. He had worked with Sir James Mackenzie, for the better part of a year, in the study of cardiac disease and it was his intention to devote his energies exclusively to that department of medicine.

In 1903 Dr. Gordon was appointed Associate-Professor of Clinical Medicine in the University of Toronto and held this appointment at the time of his death. He was an excellent clinician and exhibited exceptional ability as a teacher in the medical wards of the Toronto General Hospital, on the staff of which he was senior assistant physician. The students of the University of Toronto appreciated his worth: they have lost a true friend whose teaching was characterized by rare qualities of accuracy, efficiency and thoroughness.

Shortly after the Great European War broke out the University of Toronto offered a Base Hospital for service in the field, officered by members of the University staff. Dr. Gordon was among the first to volunteer for duty and, with the rank of Lieutenant-Colonel, was attached to the staff of the Hospital which became known as No. 4 Canadian General Hospital, now doing duty at Salonica. After the necessary preliminary training in Canada he sailed with this unit for England, but was invalided home because of the serious nature of the illness which manifested itself when he was on active service. The loss of his services in this hospital was greatly felt and it was with keen regret his fellow officers parted with him at Shorncliffe.

He was a most agreeable colleague, a man of an affectionate nature, with broad sympathies combined with exceptional professional ability. The profession has lost in the death of Dr. Andrew Gordon a man who will be greatly missed in many walks of life.

We wish to extend to his widow and family our most sincere sympathy.

LIEUTENANT STANLEY ARTHUR WALKER, R.A.M.C., whose death occurred in action on October 15th, last, was medical officer of the 12th Cheshire Regiment, and at the time of his death had been in France for about seven months. He was a son of the Reverend George Walker of Toronto and was in his twenty-seventh year. He graduated from the University of Toronto in the spring of 1915 and became house surgeon at the Toronto General Hospital, a post he relinquished in November of the same year when he went overseas to join the Royal Army Medical Corps.

DR. CHARLES RICHARD CHARTERIS, of Chatham, Ontario, died suddenly from heart failure on November 25th. Dr. Charteris was born at Chatham in 1865 and graduated in medicine from Victoria University, Toronto, in 1887. After spending two years in the hospitals of Edinburgh and London, Dr. Charteris began to practise at Florence, Ontario. In 1897 he left Florence for Chatham where he continued his professional work up to the time of his death. In addition to being medical officer of health for Chatham township, he was physician to the county jail and county house of refuge. Dr. Charteris was also at one time president of the Ontario Library Association. The loss of Dr. Charteris will be keenly felt in Chatham and the surrounding district and as a mark of appreciation of his faithful service throughout a period of almost twenty years, the following memorial of condolence has been presented to his family by the Kent County Council:

> "Whereas it has pleased Almighty God in the dispensation of His Providence to remove by death the late Charles R. Charteris, M.D., who for upwards of thirteen years was a faithful and loyal official of the County of Kent, being its physician of the House of Refuge and Jail Surgeon.
>
> "The members of the County Council desire to give expression to their high appreciation of the late Dr. Charteris, his gentlemanly bearing, his devotion to duty, his unselfish services and his high code of honour and to place on record their sense of the great loss this county has sustained by his early death and to convey to his wife and family the sincere sympathy of this council in the great affliction which has so suddenly become theirs to bear."

MAJOR R. K. KILBORN, M.D., died at Kingston on December 3rd. Major Kilborn had been in poor health for some time and last February was obliged to give up his duties as medical officer of the Royal Military College, a position which he had held for seventeen years. Dr. Kilborn was born at Frankville, Ontario, and graduated from the medical college of Queen's University in 1879. He practised at Toledo until 1891, when he became medical superintendent of the Kingston General Hospital. In 1896 he returned to general practice in Kingston and in 1899 was appointed medical officer of the Royal Military College.

DR JAMES DORLAND died suddenly on December 10th, at Adolphustown, Ontario, where he had been in practice since 1905. He graduated from McGill University in 1875 and subsequently practised in Milwaukee and Chicago. He was born at Adolphustown and was in the sixty-sixth year of his age. His only son, James P. Dorland, went overseas with the First Canadian Contingent and is still at the front.

DR. WARREN KILBORN, of Sharbot Lake, whose death occurerd in December, was born at Frankville, Ontario. He graduated from the Eclectic Medical College, Philadelphia, in 1866 and had been in practice at Sharbot Lake for almost fifty years.

News

MARITIME PROVINCES

Dr. David W. McKenzie, associate urologist of Bellevue Hospital, New York, has been appointed urologist-in-chief of the Royal Victoria Hospital, Montreal. Dr. McKenzie is the son of Mr. Finley McKenzie, of Flat River, Prince Edward Island. He graduated in Arts from Dalhousie University in 1900 with honours in pure and applied mathematics, and in medicine from Cornell University in 1904.

Dr. W. W. White, ex-president of the New Brunswick Medical Society, was the guest of honour at a dinner given by members of the profession at St. John on Thursday, December 14th, on the occasion of his fifty-fourth birthday.

ONTARIO

The following is the list of infectious and contagious diseases issued by the Provincial Board of Health for the month of November: Smallpox, 1 case; scarlet fever, 85 cases; diphtheria, 467 cases, 28 deaths; measles, 515 cases, 9 deaths; whooping cough, 91 cases, 4 deaths; typhoid, 74 cases, 11 deaths; tuberculosis, 132 cases, 56 deaths; infantile paralysis, 10 cases, 2 deaths; cerebro-spinal meningitis, 8 cases, 4 deaths.

It has been decided to rebuild the west wing of the Western Hospital, Toronto, and the plans for the new building are under preparation.

It was unanimously resolved at a recent meeting of the St. Thomas Board of Education that the school nurse be empowered to make the necessary arrangements for operations on children suffering from adenoids, polypus, or enlarged tonsils, if the parents were unable to afford the expense, such operations to be performed at the Amasa Wood Hospital by the resident doctor free of charge.

Dr. Louise A. Pennington, of Ottawa, has been appointed house surgeon to the Wolverhampton and Staffordshire General Hospital at Wolverhampton, England.

Owing to ill health, Dr. Boyd has been obliged to give up his duties as medical superintendent of the Kingston General Hospital.

A fire broke out at Grace Hospital, Toronto, on November 28th. At the time one hundred and fifteen patients were in the building. As the fire spread rapidly from the cellar where it originated, it was only with great difficulty that the patients were removed to a place of safety. Both nurses and firemen, however, acted splendidly and every patient was safely removed from the building and sent either to another hospital or to his residence. The hospital was not destroyed but a good deal of damage was done by the smoke and water.

Dr. C. J. O. Hastings, medical officer of health of Toronto, has been authorized by the Board of Control to conduct an investigation into the high cost of living.

Dr. J. B. Martyn, of Alvinston, Ontario, has sold his practice to Dr. T. A. Brandon, formerly of Watford, Ontario.

Dr. R. W. Glidden has gone into practice at St. Thomas, Ontario.

QUEBEC

The first Jewish Maternity Hospital to be established in Montreal was formally opened on November 17th. The building has sufficient accommodation for twenty patients.

SASKATCHEWAN

A municipal hospital with accommodation for twenty-five patients is to be established at Kerrobert to serve the rural municipalities of Mariposa, Oakdale, Progress, Heartshill, and Kerrobert.

BRITISH COLUMBIA

Two members of the medical profession are included in the Cabinet recently formed by Premier Brewster. Dr. J. H. King, the Minister of Public Works, is a New Brunswicker by birth and a son of Senator G. G. King. He graduated from McGill University in 1895 and has been in practice at Cranbrook. Up to the time of the recent election, Dr. King was chief whip of the Liberal party in British Columbia. Dr. John D. MacLean, Provincial Secretary and Minister of Education, is also a graduate of the Medical School of McGill University (1905) and is a native of Prince Edward Island. He has been practising at Greenwood, British Columbia.

MEDICAL COLLEGES

Toronto University

LIEUTENANT FRANCIS CARL HOWARD, who died at Frankfort, Germany, on September 9th of wounds received in action on that day, was a student in medicine at the University of Toronto. He was the son of Mr. Lewis Howard, of Toronto.

THE degree of M.B. was conferred upon the following successful candidates by the Medical Faculty of the University at a special convocation which took place on December 11th. The majority of these graduates have already enlisted for active service.

James Franklin Adams, Hanover; Frederick Grant Banting, Alliston; William Wray Barraclough, B.A., St. John, New Brunswick; Henry Norman Bethune, Toronto; Thomas Wilmot Bleakley, D.D.S., Kindersley, Saskatchewan; Frank Herbert Boone, Toronto; Arthur John Boyce, B.A., Goderich; William Easson Brown, Toronto; Beaumont Sanfield Cornell, Athens, Ontario; Daniel Irwin Davis, Port Coquitlam, British Columbia; Gordon Murray Dobbin, Toronto; John Sutherland Douglas, Dunnville; Hugh Alexander Elliot, B.A., Midland; Charles Farquharson, Agincourt; Douglas Gordon Findlay, Toronto; Donald Roderick Finlayson, Lucknow; Charles Elias Frain, Norwich; Ruggles Kerr George, B.A., Toronto; Joseph Appelbe Gilchrist, B.A., Toronto; Malcolm George Graham, Rodney; Albert Robert Hagerman, Parkland, Alberta; Roy John Hardstaff, M.D., West Devonport, Tasmania; Frederick William Watts Hipwell, Alliston; Edgar Duncan Hutchinson, Sarnia; William George Jamieson, Camborne; Andrew Murray Jeffrey, Toronto; Frederick Macnab Johnson, St. Thomas; Wilfred Joseph Johnston, Craigvale; Cecil Vernon Mills, Corunna; Harold Alexander Mitchell, B.A., Vancouver; Albert Montgomery, Toronto; Hector Clive McAlister, Ridgetown; James Clarence McClelland, Toronto; John McWilliam McDonald, Lakeside; Charles Spurgeon Macdougall, Kincardine; Angus MacKay, Woodstock; Robert MacKinlay, Aberarder; Fred Schlenker Parney, Edmonton, Alberta; Thomas William Parker Peacock, Stroud, Ontario; George Raymon Scott, Peterboro; Wilmot Edward Lenox Sparks, Toronto; William Pelton Tew, Oil Springs; Newton Oscar Thomas, B.A., St. Thomas; Charles Everett Thompson, Hamilton; Arthur Thompson, M.A., Toronto; Hugh Duncan Veitch, Winterbourne, Ontario; Thomas Esmond White, Hamilton.

McGill University

The sum of $15,000 has been given to McGill University by Dr. James Douglas of New York. It is the intention that part of this money shall be placed in an endowment fund for the publication of a series of reprints of original papers from the pen of members of the staff of the different faculties in the University. The publication of such reprints was discontinued some years ago for lack of funds.

Queen's University

The Queen's University Military Hospital, No. 7 Canadian General Hospital, left Le Tréport on November 14th to take up its quarters at Etaples. The unit now has accommodation for 2,290 patients and it has been found necessary to enlarge the staff by the addition of twenty-five nurses and a number of orderlies.

Dalhousie University

The Faculty of Medicine recently established courses of instruction for Fourth Year students in physical therapeutics or in procedures of a therapeutical nature other than those involving the use of drugs. The course includes the following: Lectures and demonstrations in massage, in the technique of the use of the *x*-rays, in electrical diagnosis and therapeusis, in the medicinal use of baths and high and low temperatures, in climatology and in dietetics.

Western University

The registration of students in the Western University Medical School for the Session 1916-1917 is as follows:

First year, 23; second year, 9; third year, 15; fourth year, 10; fifth year, 13; making a total of seventy.

At the December meeting of the London Medical Association a paper was read by Dr. McCallum, dean of the Medical Faculty, entitled, "Golden Rules framed from personal experience with facts, fancies, foibles and follies of medicine."

ARMY MEDICAL SERVICES

Among the recipients of New Year Honours, conferred by His Majesty the King and announced on December 31st, are the following members of the Canadian Army Medical Corps:

Companions of the Bath. Colonel Herbert Stanley Birkett and Colonel James Alexander Roberts.

Companions of the Order of St. Michael and St. George. Lieutenant-Colonel (temporary Brigadier-General) Robert Rennie and Lieutenant-Colonel Edward Charles Hart.

The Victoria Cross has been awarded by His Majesty the King to Major Roscoe D. Arnott, C.A.M.C., of Stratford, Ontario, for conspicuous bravery on the field of action.

Lieutenant-Colonel Ethelbert Brown Hardy, C.A.M.C., has been decorated with the Distinguished Service Order, for gallantry and devotion to duty in the field. Lieutenant-Colonel Hardy controlled the evacuation of the sick and wounded, and by his energy and courage kept up the spirits of the stretcher-bearers when they were much exhausted.

The Bar to the Military Cross has been awarded to Captain John Arthur Cullum, M.C., C.A.M.C. Captain Cullum carried out the evacuation of the wounded under very heavy fire with great courage and skill, and at great personal risk and, the *London Gazette* adds, he has on many previous occasions done very fine work.

The Military Cross has been awarded to the following members of the Canadian Army Medical Corps:

Captain Kenneth Edgar Cooke, M.D. Captain Cooke tended the wounded for two days and nights, under intense fire, with great gallantry and ability.

Captain Leeming Anderson Carr, M.B., son of Dr. Leeming Carr, chairman of the Hamilton Board of Education, for conspicuous gallantry and devotion to duty. He continually led stretcher-bearers under very heavy fire; and on many occasions he himself rescued wounded men. He set a splendid example of courage and determination.

Captain Howard Brown Jeffs, M.D., of Toronto. Although wounded himself, Captain Jeffs tended the wounded under very heavy fire with great courage and determination.

Captain Harold Wigmore McGill, M.D. Captain McGill attended and dressed the wounded under very heavy fire with great courage and determination.

Captain Victor Henry Kingsley Moorehouse, M.B., son of Dr. H. H. Moorehouse, of Toronto. Captain Moorehouse tended the wounded under very heavy fire, displaying great courage and determination.

Captain Thomas Francis O'Hagan. Captain O'Hagan rescued a wounded officer and five men under very heavy fire. Later he tended the wounded in an advanced dressing-station under heavy fire. He displayed great courage and determination throughout.

Captain William Lawrence Whittemore, M.B., grandson of Dr. William Oldright, of Toronto. Captain Whittemore, although wounded, carried out his duties with great courage and determination. He displayed great gallantry on many previous occasions.

The Military Medal has been awarded to the following members of the Canadian Army Medical Corps: Sergeant H. J. Latch, Sergeant P. Mein, Sergeant A. Rowe, Lance-Corporal L. Mills, Private E. Littlejohn, Private A. H. Stewart, Private A. Anderson, Private R. G. Calder, Lance-Corporal G. Falconer, Private R. H. Gale, Sergeant A. J. Harvey, Corporal P. Henry, and Private W. T. Herriot.

The Distinguished Conduct Medal has been granted to Sergeant A. E. Wartman and Private R. S. Collin, of the Canadian Army Medical Corps.

Captain A. J. Ireland, C.A.M.C., who was specially mentioned in dispatches on October 19th, has been transferred to the Royal Army Medical Corps.

Captain Arthur Ellis, C.A.M.C., has been appointed to succeed Colonel Nasmith, C.M.G., as officer in charge of the sanitary arrangements of the Canadian Expeditionary Forces in France and Flanders. Captain Ellis is a son of Professor Ellis, Dean of the Faculty of Applied Science in the University of Toronto. He was engaged in research work at the Rockefeller Institute when the war broke out. Captain George Campbell, C.A.M.C., will assist Captain Ellis.

Major Charles Carter, C.A.M.C., has been appointed Deputy Assistant Director of Medical Services in charge of troops at Hamilton, Brantford, St. Catharines, and Niagara Falls, with the temporary rank of Lieutenant-Colonel.

At a Court-Martial held in Toronto on December 12th, Sergeant-Major Frank H. Elliott, C.A.M.C., late acting quartermaster of the Toronto Base Hospital, was deprived of his military rank, dismissed from the Army, and sentenced to eighteen months' imprisonment with hard labour, after having been found guilty of fraudulently misapplying and embezzling foodstuff to the value of $19.04, and improperly utilizing the time and service of duly enlisted soldiers for the construction of a garage for his own use.

The Western University Military Hospital is now stationed at Seaford, Sussex, where it occupies the Ravenscroft Hospital building. Several nurses and other members of the unit who have been on duty in France have returned to England and have rejoined the hospital.

The Ontario Military Hospital, at Orpington, Kent, is to be enlarged to a capacity of 2,014 beds.

Captain M. A. Carmichael, C.A.M.C., medical officer af the 96th Winnipeg Reserves, has been transferred to the medical training school at Shorncliffe.

Captain Alfred Haywood, C.A.M.C., has been given command of the Canadian Convalescent Hospital at Woodcote Park, Epsom. Captain Haywood was assistant medical superintendent of the Toronto General Hospital and went overseas as medical officer of the 3rd Battalion.

The St. Lawrence College at Ramsgate has been fitted up as a Convalescent Home by the Canadian Red Cross Society. The hospital will have accommodation for one thousand patients and will bear the name of Princess Patricia. When ready for occupation it will be placed under the direction of the Canadian Medical Services.

LIEUTENANT-COLONEL G. CLINGAN, C.A.M.C., of Brandon, Manitoba, has been given command of the Canadian Convalescent Hospital at Monks Horton, England. Captain J. M. Eaton, C.A.M.C., has been appointed second-in-command of that hospital.

CAPTAINS W. W. WRIGHT, C. C. Ballantyne, and W. A. McDonald, of the Canadian Army Medical Corps, have left for service overseas.

CAPTAIN E. E. STEELE, C.A.M.C., has been transferred to the General List and is now attached to the Cavalry Training Brigade at Shorncliffe, with the rank of Lieutenant.

THE CANADIAN RED CROSS has granted the sum of one hundred thousand dollars to the Laval Military Hospital (No. 8 Canadian General Hospital), which is to be stationed at Vincennes. The grant is intended for hutments for the accommodation of the hospital. The unit will be situated at the opposite end of Paris to No. 6 Canadian General Hospital, which is at St. Cloud.

THE following promotions in the Canadian Army Medical Corps have been gazetted: To be Lieutenant-Colonels: Majors C. L. Starr, G. R. Phillip and D. K. Smith. To be Major: Captain Harley Smith. To be temporary Majors: Captain C. Hunter, T. D. Archibald, and T. A. Lomer. To be acting Majors: Captain T. H. McKillip and P. Poisson. To be temporary Captains: C. W. Anderson, Captain A. Arthur, H. W. Kerfoot, late Lieutenant R.A.M.C., and G. W. Grant, M.B.

DR. C. C. TATHAM has been appointed medical superintendent of the Strathcona Hospital, Edmonton, which was taken over by the Military Hospitals Commission on December 1st. Dr. H. L. Collins has been appointed to the staff of this hospital and other appontments will be made by the Commission.

MR. S. A. ARMSTRONG, who for the past seven years has been assistant provincial secretary of Ontario, has been appointed director of the Canadian Military Hospitals. Mr. Armstrong will assume complete charge of the organization and supervision of the different branches of the work of these hospitals for the duration of the war.

The Military Cross has been awarded to the Reverend W. E. Kidd and the Reverend Robert Fleming Thompson, Chaplains to the Canadian Expeditionary Force, for assistance rendered to the wounded.

Major W. W. Judd and Captain C. H. Hudson have resigned their commissions in the Canadian Army Medical Corps.

The following members of the Canadian Medical Service are mentioned in despatches in connexion with the operations at Salonica: Colonel J. A. Roberts, Lieutenant-Colonel W. B. Hendry, Lieutenant-Colonel E. C. Hart, Major C. H. Morris, Captain W. A. Clarke, Sergeants W. C. Milne, N. N. McPhedran, G. Nairn, Private T. H. Sayer, Matrons A. J. Hartley, F. Wilson, Sisters A. Dickison, F. A. Hunter, L. Brock, G. McCullough, M. F. Morrison.

CASUALTIES

Died on Service

Nursing Sister Adrunna A. Tupper, of Bridgewater, Nova Scotia, died in London from illness resulting from heavy work near the trenches in France. Miss Tupper was decorated by His Majesty the King with the Royal Red Cross four days before her death.

Wounded

Major Roscoe D. Arnott, C.A.M.C.

Captain N. M. Macneill, C.A.M.C.

Captain H. R. Mustard, C.A.M.C. This is the second time Captain Mustard has been wounded.

Dangerously Ill

Lieutenant W. Clifford M. Scott, R.A.M.C., son of Mr. J. G. Scott of Ottawa. Lieutenant Scott graduated in medicine from McGill University in 1914 and afterwards did post-graduate work at the Bellevue Hospital, New York. He joined the Royal Army Medical Corps in January, 1916. Lieutenant Scott was awarded the Military Cross for distinguished conduct at the battle of Thiepval.

Seriously ill

Colonel C. F. Gorrell, C.A.M.C., of Ottawa, Commandant of the Duchess of Connaught Red Cross Hospital at Taplow.*

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* Later reports state that Colonel Gorrell is much better.

Correspondence

To The Editor,
Journal of The Canadian Medical Association.

Sir,—I am taking the liberty of sending you under separate cover a marked copy of the weekly issue of *The Times of India* in which is contained a typographical error resulting in a remarkable statement which I thought might bear repeating in the Journal for the amusement of some of the men at home. Such errors are apparently rather common here, perhaps because of native workmen, and another example is afforded by the sign in front of the Allbless Obstetric Hospital, which reads Allbless Obs-tetric Hospital,—a hyphen being interposed without any visible reason. It is quite true, however, that while these mistakes indicate the natives' difficulty in handling the language, they also show poor proof-reading and a peculiar habit of easy-going on the part of somebody who knows better.

You might be interested to know about Canadians whom I have heard about in this part of the world. I do not know their initials in most cases and am not certain of their year of graduation.

There is a man Brown, Toronto, 1908, recovering from enteric at St. George's Hospital in this city.

Little, Toronto, 1914, is on sick leave in India following fever, probably paratyphoid.

Maclachlan, Queen's, is in Colaba Hospital here recovering from fever.

Moon, Toronto, 1914, and Ball, Toronto, 1914, are at the front in Mesopotamia.

Roy Philps, Toronto, 1914, is with No. 23 Indian General Hospital at present at Basra, Mesopotamia.

D. Ramsay, McGill, is at the front in Mesopotamia.

Lyons, Dalhousie, is also in Mesopotamia.

Sincerely yours,
Edward Fidlar,
Lieutenant, R.A.M.C.

Bombay, October 10th, 1916.

The above letter will be of interest to some readers of the Journal. Unfortunately, the copy of the *Times of India* to which Dr. Fidlar refers has not been received.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Canadian Practitioner and Review, October, 1916:

Blood Transfusion: The Author's Technique. Report of eighty-five transfusions	L. J. Unger.
Medical problems involved in the classification, treatment, and final disposition of invalided soldiers	F. W. Marlow.

The Canadian Practitioner and Review, November, 1916:

Some of the poisonous plants of Ontario	F. Arnold Clarkson.
President's Address before the Toronto Academy of Medicine	J. Ferguson.

Dominion Medical Monthly, October, 1916:

The use of morphine and hyoscine in obstetrics	J. A. Kinnear.
The definite treatment of pneumonia	S. S. Cohen.

Dominion Medical Monthly, November, 1916:

President's Address before the Toronto Academy of Medicine	J. Ferguson.
The direct transfusion of blood: its value in hæmorrhage and shock in the treatment of the wounded in war	A. Primrose and E. S. Ryerson.

The Western Medical News, October, 1916:

Accessory sinus suppuration, symptoms and complications	A. N. Hardy.

Canada Lancet, November, 1916:

President's Address before the Toronto Academy of Medicine	J. Ferguson.
Tuberculosis: A social disease	Sir James Grant.

La Clinique, October, 1916:

Quelques idées nouvelles sur la determination du sexe	V. Delfino.

Le Bulletin Médical de Québec, October, 1916:

Hygiène de l'enfance avant la période scolaire	R. Fortier.
Phlegmons du plancher buccal	J. B. Lacroix.

Le Bulletin Médical de Québec, November, 1916:

La loi des médicaments brevetés ou proprietary	L. F. Dubé.
Les remèdes brevetés	P. C. Dagneau.
Les sirops calmants	A. Jobin.
Médicaments qui guerrissent—Médicaments inutiles—Médicaments qui tuent	A. Vallee.
Le médicaments brevetés et la fraude par la poste	L. F. Dubé.

La Clinique, November, 1916:

Le corset	G. Juilly.
La loi des médicaments brevetés ou proprietary au Canada	L. F. Dubé.
Historique et technique de la cuti-réaction de la tuberculose	M. Imbert.

The Western Medical News, September, 1916:

Meningococcus meningitis	J. G. Fitzgerald.
Medical attendance to the people of the province	J. A. Valens.

The Canadian Journal of Medicine and Surgery, December, 1916:

Galyl in the treatment of syphilis	Gordon Bates.

The Canadian Practitioner and Review, December, 1916:

A case of shell shock	E. Ryan.

Dominion Medical Monthly, December, 1916:

The law and the doctor	W. R. Riddell

The Public Health Journal, September, 1916:

Retrospective and prospective	W. H. Hattie.
A Federal Bureau of Public Health	J. B. Black.
Some references to the practice of medicine then and now	G. E. DeWitt.
Disinfection	J. K. McLeod.
Cerebro-spinal fever from the standpoint of epidemiology	A. G. Nicholls.

The Public Health Journal, November, 1916:

The defective immigrant	C. K. Clarke.
Presidential address (delivered before the Canadian Public Health Association)	P. H. Bryce.
Importance of housing and lodging house inspection	J. S. Schoales.
Sanitation as it was	A. P. Reid.
Small water works and sewage	R. O. Wynne-Roberts.

Of the early history of medicine in Canada very little is known. The first medical man of whom there is any record is Dr. Bouchard, who was born in Paris in 1622. As a master surgeon he signed his engagement with the "Company of Montreal" in 1653, and four years later married Marguerite Boissel at Quebec, by whom he had nine children. His residence in Montreal was in Notre Dame Street, near the site of the present City Hall. By a contract dated March 30th, 1655, he agreed with twenty-six heads of families to treat the husband, wife, and children, "born and to be born," for one hundred sous each, either party to have the right to withdraw at will. He died at Montreal on July 20th, 1676, at the age of fifty-four years.

Medical Societies

CANADIAN PUBLIC HEALTH ASSOCIATION

At a well attended meeting of the Executive Council of the Canadian Public Health Association held in Toronto on December 12th, 1916, the following were elected to the executive committee for 1916-17: Dr. J. W. S. McCullough, of Toronto; Dr. M. M. Seymour, of Regina, and Dr. W. H. Hattie, of Halifax.

These, with the president, Dr. J. D. Pagé, Quebec, the general secretary, Dr. J. G. Fitzgerald, Toronto, and the treasurer, Dr. George D. Porter, constitute the executive committee of the association.

The 1917 meeting will be held in Ottawa in September.

TORONTO ACADEMY OF MEDICINE

Report of the Proceedings of the Stated Meeting of The Academy of Medicine, Toronto, December 5th, 1916

Professor V. C. Vaughan in his address upon the subject "The Protein Poison and its Relation to Immunity and Disease," at the December meeting of the Academy of Medicine, discussed the position of the bacteria among living things. According to our conception and definition of vegetable life, we cannot consider bacteria to belong to this group—no cellulose is present—neither do they belong to the animal group. They must be placed in a group of their own.

They contain, instead of a nucleoproteid, a glyco-nucleoproteid. In the study of the chemistry of bacteria the colon bacillus has been used in a large series. Finding that this bacterium when dead, is toxic to animals, an attempt was made to separate the poisonous from the non-poisonous part. The poisonous part is soluble in alcohol and ether, and the non-poisonous is insoluble in alcohol.

Further study was made to find whether non-pathogenic bacteria likewise contain a poisonous and a non-poisonous substance. This was found to be true.

Attempts were made to find out whether a similar poison was found in the higher nucleo-proteids of animal cells, and later vegetable proteins, gluten of wheat, etc., were studied and proven to contain the same poisonous substances.

Every true protein contains a poisonous substance and whatever the source of the protein, the poison is similar.

Those with the larger content of the protein poison are the proteins of our daily food. Casein contains, perhaps, the highest proportion of the portein poison. It is not a poison when administered by the mouth. It is dialysable but dialyses very slowly and is absorbed very slowly from the intestine. It is split up into harmless amino acids by the digestive ferments. While not exactly alike from all its sources, its effects on animals is similar in its lethal properties.

The symptoms and lesions of disease are not due to the growth and multiplication of the infective bacteria in the body. For (1) they are rapidly growing during the stage of incubation when neither symptoms nor lesions are present, and (2) dead bacteria injected into the blood stream cause the same lesions, e.g. in typhoid, dead bacteria will cause all the ulcerative processes.

The strong, vigorous man elaborates substances which kill the invading bacteria. With heavy dose and great resistance the bacteria are rapidly killed and the protein poison sets up acute symptoms. In a study of the records of typhus and typhoid epidemics from those in England and Ireland two hundred years ago down to personal investigations in the American Army in 1898, it is an outstanding fact that the case mortality is greater in the strong and vigorous than in the weak and feeble. The case incidence is greater amongst men than women, in young adults than older adults. In Ireland many years ago it was shown that amongst the poor, half-starved peasants the case mortality was one in twenty-three. Amongst the physicians, nurses, priests and social helpers the mortality was one in two.

The dead bacillus of a species to which an animal is immune rapidly kills the animal from the rapid setting free of the toxic substances. The dead bacillus of a species to which the animal is non-immune does not rapidly kill the animal, but it grows in the animal without the rapid killing and setting free of the protein poison. In the period of infection of an acute infectious disease there are no symptoms, but during the invasion and fastigium the invading bacteria are being destroyed, toxins are set free and the stage of symptoms has arrived. With leucocytosis active there is less toxin set free and symptoms are definitely less.

The subject of anaphylaxis was discussed in short and it was pointed out that when a patient is susceptible to horse serum or diphtheria antitoxin, the injection of one minim will overcome this and in a few hours any quantity may be injected without danger.

Professor Vaughan pointed out that the protein poison is a poison not a toxin. There is no antidote. It does not form an antitoxin.

Vaccines may stimulate protective substances to overcome a localized lesion, but the use, for example, of tuberculin in cases of extensive pulmonary disease seems rash, unscientific and doubtless does much harm in many cases.

The use of vaccine in a patient who is weak, e.g., in advanced myocardial disease, is to be deprecated. The setting free of the protein poison may cause disastrous results.

In closing, Professor Vaughan illustrated his lecture by lantern slides, showing the construction of the large tanks in which he grows his bacteria for chemical study, and a series of charts illustrating the febrile reaction in animals subjected to subcutaneous and intravenous injections of various protein susbtances, bacillary and non-bacillary in origin.

The paper was discussed by Professor Hunter, Professor J. J. Mackenzie and Major Fitzgerald.

J. H. Elliott,
Honorary Secretary.

PETERBOROUGH MEDICAL SOCIETY

A meeting of the Peterborough Medical Society was held on November 16th, which was well attended, not only by local men, but also by several members from the surrounding towns. On this occasion a very instructive lecture was given by Dr. Goldwin Howland, of Toronto University, entitled "The simplest method and ultimate object of examining the nervous system." Cases were presented by Dr. Buchanan to enable the lecturer to demonstrate his methods. A hearty vote of thanks to Dr. Howland was proposed by Dr. Greer, seconded by Dr. Ford.

The next meeting of the society will be held on December 14th, at which Dr. Ford, of Norwood, will read a paper entitled, "An analysis of three thousand cases of obstetrics."

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Annual meeting. Toronto, May 31st-June 2nd, 1917

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PARATYPHOID IN THE ARMY AT THE DARDANELLES*

By E. N. Coutts, M.D.,

Lieutenant R.A.M.C.

THE object of this article is to give a brief clinical picture of paratyphoid fever as it has existed in the army at the Dardanelles. This picture is modified in some cases by the concurrence of other infections that exist in this region, especially of the enteric infections, amœbic and bacillary dysentery, trichomonas, and vibrios; and of malarial fever.

The number of cases of paratyphoid A. and B. bacteriologically diagnosed, that these observations are based upon is about equal, sixty-six of the former and sixty-three of the latter. The majority of the cases of paratyphoid B. occurred in the hot summer months, when the fly was ubiquitous, and dysenteric infections frequent. Most of the cases of paratyphoid A. occurred in November and December, when these infections had greatly diminished. Hence it is paratyphoid B. that has been modified by them, and chiefly in inducing more severe and protracted diarrhœa. Eight cases of paratyphoid fever have been included, in which the bacilli isolated possess the cultural characteristics of paratyphoid, especially of paratyphoid B., but do not agglutinate with the sera of either paratyphoid A. or B. They are not distinguishable clinically from other paratyphoids. Neither is it possible with any assurance to distinguish clinically paratyphoid A. from paratyphoid B.

The bacteriological diagnosis was determined by blood culture in ninety cases; by isolation of the organism from the fæces in twenty-four cases; and by serum agglutination in twenty-four cases. Some of the paratyphoids arrived in hospital too late for successful blood culture, as it was only in the early stage that the organism could be isolated from the blood, generally within the first ten days. In such cases the stools were examined; or the agglutination test was done after the temperature became normal. In one case bacillus paratyphoid A. was isolated from the fæces in the third week, the patient still running a temperature, blood taken on the same day being negative in its agglutination test. After the stools became formed the organism was not so readily obtained, even after purging, as from the fluid stools of persistent diarrhœa. The agglutination requirements were positive and complete agglutination in dilutions not less than 1:100, with a time limit of one hour.

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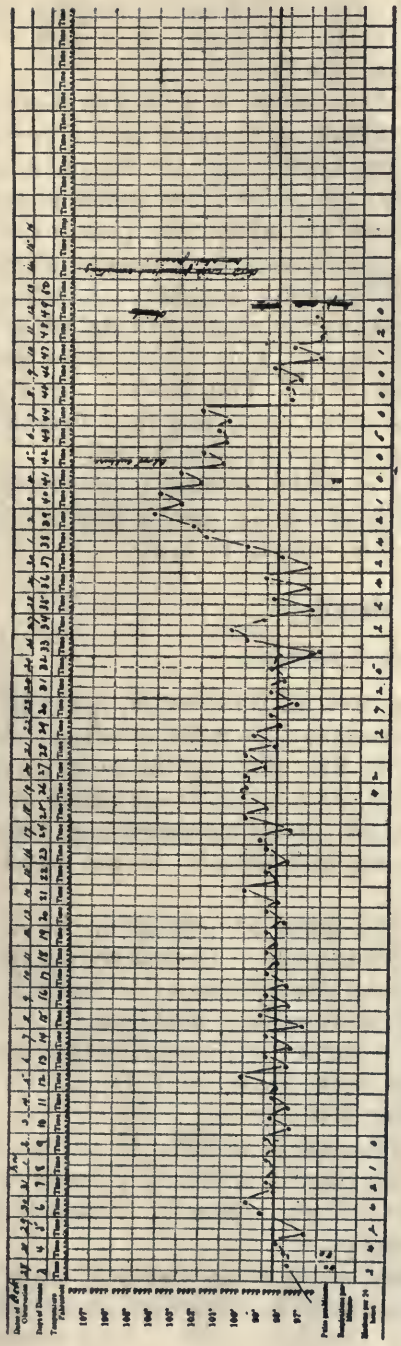
*Illustrative charts and summary of case reports for thirty-four cases were appended to this article. It has been possible to publish only three of the charts and a limited number of cases.—Ed.

Paratyphoid fever resembles typhoid fever so closely that without the guiding aid of bacteriological investigation the majority of cases occurring here might have been diagnosed as typhoid, and the milder type of the disease attributed to the protective power of inoculation. Ninety-five per cent. of these cases occurred in persons previously inoculated against typhoid and most of the typhoid cases occurred in uninoculated persons. By the bacteriological determination of the disease in individual cases it has been possible to group its symptoms, and to note the features which distinguish it from typhoid and other diseases. It is difficult to overestimate the immense importance to the Army, especially in these regions of tropical disease, of skilled bacteriologists, such as we have been most fortunate in having in Mudros East.

Paratyphoid fever resembles typhoid in its general outline and features. It differs in some of its details, and in its shorter and less virulent course. Its onset is often definite or abrupt. It was relatively so in 60 per cent. of these cases. In typhoid the onset is more rarely abrupt. Paratyphoid tends to reach the acme of its acuteness more speedily; and relaxes its grip again more readily. Typhoid as a rule shows greater steadiness and insistence. Paratyphoid may present a similar chart, but rarely pursues its course so long, with so little variation. It weakens and recedes, and renews its attacks again with lessened vigour. Hence remissions and intermissions in temperature appear earlier, and are more marked and frequent in paratyphoid. The mortality in these cases was about 4 per cent.

The patient may be suddenly overwhelmed while on active duty, with shivering, severe headache, dizziness, and weakness.

CHART I.—PARATYPHOID A. ATYPICAL



Illustrating Case 3. Note the long period—upwards of five weeks—between the onset of the disease and the acute exacerbation which terminated fatally. The bacillus was isolated from the blood on the seventh day after the onset.

Other symptoms follow: nausea or vomiting, abdominal pain or diarrhœa; aching of the back or limbs. The attack may begin in the night, the patient awaking feeling ill. In cases of less severe onset it may yet be quite definite in point of time. Previously quite well, on rising in the morning he has lost desire for food, feels tired, chilly, has some headache or other symptoms, but continues on duty for a varying period of time, and may even improve temporarily to yield later on to the disease. Occasionally the body contends for many days or weeks with the disease on almost equal terms, to succumb in the end to a final acute exacerbation, e.g. Cases 3 (See Chart I) and 4. In many other cases the onset is as insidious and gradual as it ever is in typhoid fever, Cases 10 and 26.

The rise of temperature may be sudden, reaching 103° within a few hours, in correspondence with the abruptness of the acute symptoms—Case 12; or gradual, extending over several days or a week in step-ladder style until the patient feels ill—Case

5. On the other hand the patient may report in morning with subnormal temperature, feeling quite ill. It may continue low in the morning for some days, rising at night.

With the full development of the invasion in severe cases the face is generally flushed, it may be swollen; the eyes heavy, perhaps injected; the expression dull; the breath offensive; the tongue furred, sometimes enlarged, moist or dry; the pulse occasionally dicrotic. There may be headache or diarrhœa and abdominal pain, or backache. In a few days more the patient may be mentally sluggish or incoördinated; memory defective; voice unsteady; mouth and throat dry; occasionally delirious or haunted with delusions or fears. He looks older than his years. This acute stage rarely lasts longer than a week or ten days. The mental cloudiness diminishes; the tongue becomes moist, and the face brightens; the temperature vacillates as the disease loosens its grip.

Moderate cases are frequent in which mental confusion does not occur, and the acute stage is brief. Mild cases occur in which the patient does not feel disposed to remain in bed.

Consideration of symptoms in detail.

DIGESTIVE SYSTEM

Vomiting occurred in 26 per cent. of these cases, generally at the onset; occurring either spontaneously, or quite as often indeed by the taking of food or drink. In five cases, all of them paratyphoid A., it was severe, persisting for several days; either in the course of the severe period, or after the temperature had become normal. Nausea without vomiting was present at the onset in 9 per cent.

The tongue is coated early, and tends to dryness in the acute stage, especially with mouth breathing which frequently occurs in severe cases. It may have a heavy grey white or brown fur, or may present a baked, scaly, or crushed surface, with fissures. The fur may be general or patchy—a central red surface with lateral strips; or a general coating with clean edges and tip.

The teeth are prone to coating with sordes.

The throat is often dry causing discomfort; in 13 per cent. it was sore, generally in the early course of the illness; in some with little change in appearance; in others markedly injected and swollen. The tonsils were not swollen.

Diarrhœa, mild or severe, occurred in 80 per cent. of cases, as a rule in the first week, not infrequently as the initial symptom of onset, and often associated with abdominal pain. It sometimes was very mild, and lasted only one or two days. There might be one liquid stool one day, then constipation for several days, followed by one or more liquid stools without laxative. The diarrhœa frequently continued into the second or third week, and occasionally much longer.

It was the initial symptom in nineteen cases, sixteen of them paratyphoid B., two paratyphoid A., and one paratyphoid X., preceding the other symptoms of onset by periods varying from one to three days to one to three weeks. To illustrate: Case of Private T——. Diarrhœa, worse at night, with four or five liquid stools daily, continued until sudden onset of acute symptoms one week later; admitted then to hospital; bacillus paratyphoid B. isolated from the blood; diarrhœa began to diminish soon after admission.

Case 2, Private J——. Diarrhœa began September 3rd, while in hospital, four to six liquid stools daily, kept getting quite weak; September 17th, onset of headache, dizziness, chilliness, vomiting, pain in back. Bacillus paratyphoid B. isolated from blood.

Nine of these cases of initial diarrhœa were uncomplicated. Six others had amœbic dysentery prior to the onset of paratyphoid, and were convalescent, or partially so,—perhaps several semiformed stools obtaining daily. In none of these cases did the character of the paratyphoid diarrhœa appear to be measurably altered by the preceding dysentery, either in the length of its period, or its severity. It is possible that the damage to the intestine by the dysenteric organisms may have rendered it more susceptible to the initiation of diarrhœa by the paratyphoid organism.

In one case trichomonas and vibrios were discovered in the stools in addition to bacillus paratyphoid B. The diarrhœa was prolonged and exhausting, but no more so than in one of the uncomplicated cases. By uncomplicated one means that no other known diarrhœa-producing organism was discovered in the fæces than bacillus paratyphoid. One could not conclude with certainty that this organism was alone concerned in causing this diarrhœa, although it appeared probable.

In two cases of diarrhœa admitted to hospital the fæces were examined for dysentery. None of the dysentery-producing organisms were found, but bacillus paratyphosus B. was isolated by Mr. Logan, and within a few days the temperature course and clinical symptoms of paratyphoid began to develop.

The special symptoms of paratyphoid B. were probably partly seasonal in cause. Although more frequent as an initial symptom in paratyphoid B., diarrhœa occurred in paratyphoid A. in a greater percentage of cases, and in some of them with marked severity, and nearly always in the first week of illness. It is interesting to note that in a case of perforation by paratyphoid A. there was only constipation.

Dysentery occurred in fourteen of the whole series of cases; in two of them concurrently with the paratyphoid, giving rise to very severe and serious illness; in twelve either preceding or following the paratyphoid illness or both, giving rise also in some cases to an exhausting illness. Vibrios were also found present in several of the more severe of these cases.

Abdominal pain and tenderness occurred in nearly 70 per cent. generally as symptoms of onset, or in the first week of illness, and frequently associated with diarrhœa. Sometimes the patient would be seized with abdominal pain, and at the same time, or in a few hours, or next day, diarrhœa would occur. Sometimes it was present only prior to evacuation of the bowels, and relieved thereby. In some it was mild and transient; in others it dominated the situation during the first or second week along with the diarrhœa. After the first or second week it was seldom troublesome. It affected any part of the abdomen, being most frequent in the upper zone. Tenderness lasted longer than pain, and was most frequent in the epigastrium.

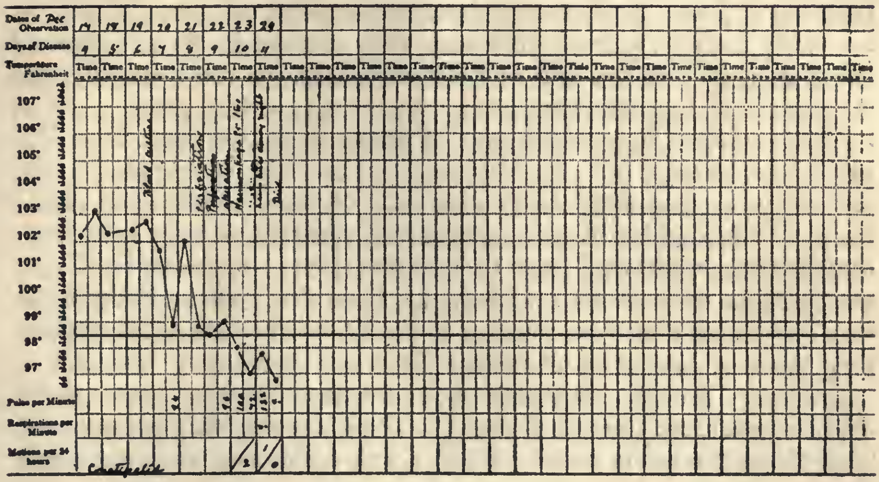
Hæmorrhage occurred in four cases, two paratyphoid A., and two paratyphoid B.; one slight, with blood well mixed with fæces, the others severe; all in the second week of illness.

Perforation occurred in two cases, one paratyphoid A. in the eighth day of illness. Operation revealed two perforations in the lower ileum, and a third ulcer almost perforated. This patient was admitted on the fourth day of illness, and suspected to be a case of appendicitis. He had no diarrhœa. After operation he had repeated severe hæmorrhages which hastened his death. (See Chart II).

The other perforation was in a case of paratyphoid B. on the twenty-eighth day. Post mortem revealed the perforation in the descending colon, with several healed ulcers near it. Peritonitic adhesions were present in the abdomen. Bacillus paratyphoid B. had been isolated from the blood. Examination once of the fæces for dysentery organisms was negative.

Abdominal distension was not a marked feature. There was

CHART II.—PARATYPHOID A, WITH PERFORATION



Illustrating Case 24. Death occurred from repeated hæmorrhages two days after operation for perforation.

frequently some fulness of the abdomen, and sometimes a marked distension with the severe abdominal symptoms of the early acute stage.

The spleen was palpable in about 45 per cent. of the cases.

There was never any evidence of trouble in the gall bladder.

Hepatitis occurred in one case during convalescence, with chills and high flights of intermittent temperature, enlargement and marked tenderness of the liver. It was probably amœbic in origin, and yielded to prompt and vigorous treatment with emetine.

Circulatory system. The pulse is slow relative to the temperature, as in typhoid. To illustrate: a pulse of 93 with temperature of 103°, pulse of 100 with temperature of 104°, pulse of 68 with temperature of 103° were observed.

The first heart sound was frequently softened; the pulmonary sound accentuated. A systolic murmur was not infrequent; perhaps existing prior to illness in some cases. It was sometimes loudest near the sternum. In several patients the heart was broadened to percussion, the pulse quickened, and the patient detained in bed during convalescence because of the cardiac deficiency.

Anæmia was quite marked in twenty-five of these cases in convalescence. It was relatively more frequent in those who had suffered from protracted diarrhœa, with other enteric infections. It was very marked in three cases with concurrent malaria. Even in uncomplicated cases, however, anæmia was occasionally pronounced. Leucopænia was present in the cases examined.

Respiratory system. Epistaxis was present in 20 per cent. of cases, generally in the first and second weeks; in one case only was it severe. Cough was present in 47 per cent. of the cases.

Bronchitis existed in many of these cases, evidenced by dry râles, sometimes moist. Capillary bronchitis occurred in one with cyanosis and respiratory distress. Patches of impaired resonance, and bronchial breathing occurred sometimes with very little disturbance, without cough or expectoration. Pneumonia of very severe type may occur and help to close the scene. Respiration was quickened out of proportion to the pulse in acute cases without any signs of bronchial disorder. It was occasionally irregular in character. Mouth breathing was common in the acute stage. Pleurisy occurred in several cases. The pulse was only occasionally dicrotic in the acute period; later it was small and very compressible.

Fever. The temperature may rise abruptly to 102°-104° as in Case 12; or ascend by gradations through a period of two or three days to a week or longer. It maintains itself at this high level with moderate daily remissions for a shorter period than obtains in typhoid fever, frequently not more than a week, and then descends. Its descent may be abrupt to the normal line in one or two days as in Case 19, but is generally more gradual, and frequently by a long period of lysis, with marked daily remissions.

While this is a description of the general plan, there are innumerable variations. The plateau may be broken by morning remissions to the normal line or below it; or may be entirely replaced by a remittent or intermittent peak-like period. Or the descent may be fairly abrupt from the plateau period to nigh the normal line, the temperature then hovering above the normal for a time, to rise again in irregular fashion. Finally at rest it runs a subnormal course 97°-98° morning and evening for weeks, with slight variations.

It shows a marked tendency to recrudesence for periods of several days, or to relapse—16 per cent. of these cases. This occurred at any interval up to ten days after the temperature became normal. Some of these cases of recrudescence were associated with secondary infections of streptococci, as demonstrated by blood culture by Captain Archibald. Two were associated with acute abdominal pain and vomiting. The recrudesences would appear to be generally the natural expression of the activity of the disease, the variability and changefulness of which is very marked. With most of them there were no appreciable symptoms. The relapse was quite similar to the primal attack; occasionally more severe. There occurred some cases of long continued high temperature of remittent or intermittent type with remarkably little toxæmia or disturbance of function. On the other hand there were also some cases of very moderate temperature course with very severe illness, two of them fatal. The temperature may occasionally become elevated before the patient is aware of symptoms of illness, or may be little elevated or even subnormal with feelings of weakness and illness.

Skin. The face is generally more or less flushed, occasionally swollen, in the acute period of illness. The flush remains through the acute stage, and begins to fade as the disease abates, when slight pallor may appear. The flush may be entirely absent from the beginning even in acute cases. Rarely an erythematous flush appeared over the body in the acute period. Sweating is not infrequent at onset, accompanied by hot or cold sensations.

The rose spots appear generally in the second week. They have appeared as early as the fourth day, and as late as the twenty-third day. They may appear at first as indefinite faint rose spots, and gradually become defined in form as round elevated spots with convex surface, sensitive, fading on pressure. They were present in 60 per cent. of cases. There may be only one or two; or they may be present on every inch of the body. In 5 per cent. they extended on to the arms and thighs. As the matured spots fade new ones develop. After disappearing brown stains may remain. They may vary in form and size. Sometimes they are markedly elevated and irregular in outline, the colour fading and leaving the elevations persisting for a time. They may abort before becoming elevated, and quickly disappear, or the individual spot may continue for over a week. These variations may occur in a single patient with numerous spots.

Nervous System. Headache is the most frequent of all symptoms, appearing early in the onset, and persisting frequently into the acute stage of illness. It was present in 86 per cent. of cases. Dizziness may be associated with it in acute onsets, or when the man persists on duty. It is more prone to occur after a change of posture.

Delirium may occur in the acute stage of severe cases, muttering, with hallucinations or delusions. One patient, with an acute period of about a week, with temperature ranging above 104°, became wildly maniacal. He fled from his tent, haunted by terrors of pursuit and death. In thirty-six hours his delirium had entirely passed. His temperature stepped down almost to normal in a stride of twelve hours, and convalesence went on uninterruptedly.

Tender toes, pains in the feet, aching calves occur as in typhoid. In severe cases the abdominal reflexes may be temporarily absent; very rarely they may be increased; the knee jerks also are not infrequently absent for a short time in severe cases.

Chilliness was complained of in 70 per cent. of cases.

Renal system. Albuminuria is not infrequent in the acute period; it soon passes. Nephritis occurred in one case, of a serious type. Hæmaturia occurred in another without a continuing nephritis. Retention of urine occurred in one case during the most acute days.

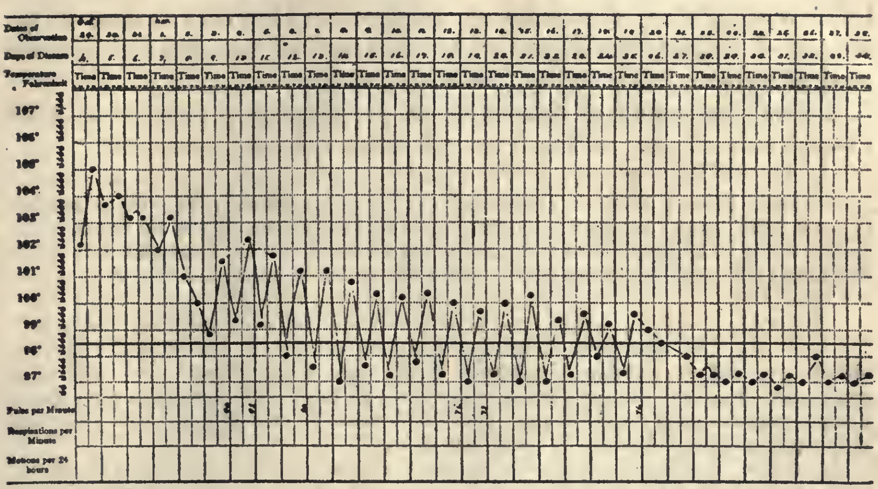
Special senses. Impairment of hearing occurred in six cases, due to plugging of the ears with wax. In eight others there was slight temporary impairment without local signs. Otorrhœa occurred in one case.

Diagnosis. From an analysis of these cases it is quite impossible to diagnose paratyphoid A. from paratyphoid B. There is no symptom or aspect of disease which one might set forth as peculiar to one, which is not well represented in the other. The average course of temperature in each was twenty-one days.

From typhoid fever there is no single symptom that can be relied on for diagnosis. The relatively more abrupt onset of paratyphoid is of importance. The greater toxicity of typhoid is also of importance. The temperature course should be closely observed. There is more marked tendency to remission, or intermission in any stage of paratypoid. As the disease advances the more tenacious character of typhoid, the less varying persistence of its temperature course, its greater toxicity, the later development of abdominal symptoms, may aid in diagnosis. It is impossible, however, in a considerable percentage of cases to differentiate clinically the two diseases. Typhoid itself may have an abrupt onset, and paratyphoid may have a gradual onset. The temperature course is not distinguishable in a number of cases, and a moderate typhoid previously inoculated or uninoculated, may be no more toxic than many paratyphoids.

Some cases of pneumonia resemble paratyphoid in the first few days. A case of lobar pneumonia was admitted to the paratyphoid

CHART III.—PARATYPHOID X



Illustrating Case 1. Typical, except that the bacillus isolated from the blood, although resembling Paratyphoid B, was not agglutinated by sera of either A or B.

section with record of abrupt onset, chillness, headache, pain in back, general soreness, with no cough or expectoration; with very little change in the lung; with temperature 104° and pulse 112-120; with severe abdominal pain and marked distension dominating the clinical scene.

The occurrence of bronchitis and localized patches of pneumonia as early complications in paratyphoid emphasizes the importance of careful examination of the lungs. The pulse-temperature ratio is of value in diagnosis.

Some influenzal types and other infections with paratyphoid—like onset, with five or six days temperature were difficult to distinguish at first. It is most important that blood culture should be done in all suspicious cases as early as possible. The association of liquid stools; the pulse ratio; epistaxis; early cough; appearance of rose spots; enlargement of the spleen, are important considerations in diagnosis. The presence of either rose spots or a palpable spleen in conjunction with other symptoms is significant.

Relapsing fever has a more sudden and rapid development than paratyphoid. Blood films should be examined in suspicious cases.

Malarial fever occurred concurrently in several cases of paratyphoid. In two it was present at onset; dominating the picture in one; concealing its expression in the other. In both the illness was exceedingly severe until the malaria was controlled by intramuscular injections of quinine. The occurrence of repeated chilliness, accompanied by increase of temperature should lead at once to the examination of blood films.

The treatment of paratyphoid is essentially similar to that of typhoid. Space will not permit of its consideration here.

Case 1. Private W——. Inoculated twice in November, 1914. Onset sudden, October 26th, supper as usual preceding night and slept well. Took no breakfast or dinner; felt a little dizzy. About 3 p.m. seized with severe chill, headache, and severe abdominal pain; vomited some milk; restless during the night; in bed next day, vomiting again.

30–10–15. Very ill, severe headache and abdominal pain, mentally incoherent.

1–11–15. Delirious with delusions, trying to get out of bed at night; tongue furred, grey and dry; abdomen generally tender; spleen not palpable; two rose spots appearing. Had one liquid stool October 28th; no more until 31st, then three liquid stools; vomited; some cough; temperature 103°, pulse 93 at 2.30 p.m.; knee jerks and abdominal reflexes not elicited; pulse not dicrotic.

3–11–15. Delusions still present at times; tongue dry, red, a lateral strip of fur; sordes heavy; abdomen much distended, and tender all over; spleen not palpable.

7–11–15. Headache less severe, rational; abdomen distended; tender in epigastrium; large crop of rose spots extending on to arms and thighs. Bacillus isolated from the blood with cultural characteristics of B. paratyphosus B., but not agglutinable by sera of A or B.

12–11–15. Abdomen flat; no pain or tenderness; heart sounds clear; pulse 56, temperature 98 3-5° at 10 a.m.

15–11–15. New rose spots still appearing; stools liquid; quite bright; tongue clean.

25–11–15. Stools formed; convalescing well.

Case 2. Private F——. Inoculated against typhoid twice in 1915; illustrates a mild type of case.

10–12–15. Headache, lasting a week; pain in abdomen and chest lasting four days.

12–12–15. Hot, sweating.

16–12–15. Rose spots present, spleen not palpable.

22–12–15. Spleen not palpable, enlarged to percussion looks well, feels well; not much affected by illness.

B. Paratyphoid A. was isolated from blood. Temperature on second and third day was 102°, on fifth day 101 2-5°, after this varied between 100° and 97°. Duration twenty-one days.

Case 3. A. B. R——. Inoculated twice in April, 1915. Onset sudden, October 24th, at night; headache, felt hot; vomited twice; reported ill a.m. 26th; admitted 27th; under observation as paratyphoid suspect five days. On admission temperature subnormal, headache persistent; tongue moist, slightly furred; no rose spots; no abdominal pain, tenderness, or diarrhœa; spleen not palpable.

October 31st. Transferred to medical section. He dressed himself daily for some weeks, not remaining up long because of weakness. No other complaint. About December 1st, complained of sore throat, no other pain. Temperature rose and B. paratyphosus A. was isolated from blood.

December 9th. Pharynx very red and swollen, tonsils not swollen; painful to swallow; some cough; first heart sound muffled; second sound low; abdomen flat, not tender; spleen palpable; no spots, no headache or pain except in throat.

December 14th. Vomiting.

December 18th. Vomiting daily since 14th, taking very little nourishment; sleepless; pulse very weak; died at 3 a.m.

Case 4. Sapper G——. Aged twenty-one; inoculated twice, April, 1915. Onset November 2nd, a.m., with "sickness, dizziness, blindness," nausea; pain behind eyes; severe headache; pain in abdomen; diarrhœa. Reported ill on 4th, and remained on light duty till 9th; then relieved and admitted to hospital on 12th; temperature, November 9th, and 10th, 100°-100·2°. On admission occasional headache; tongue furred; spleen not palpable; some rose spots; stools liquid. About November 24th, or 25th, headache began, and chilliness; sweating; pain in abdomen, and in lower part of back and hips; stools continuing liquid.

December 1st. Face slightly flushed; eyes slightly injected; breath fæcal; tongue dry, coated dirty white, fissured; mouth and throat dry; thirsty; breath strongly fæcal; abdomen soft, slightly tumid; slight tenderness in epigastrium; spleen palpable; rose spots on chest and abdomen; pulse dicrotic.

December 6th. Headache gone; slight soreness in back and thighs; spleen not palpable; abdomen not tender.

December 16th. Tongue still furred, moist; feeling well; no discomfort.

B. Paratyphosus A. isolated from blood taken November 29th. In this case there was a distinct remission of temperature to normal for several days, with a recrudescence setting in on November 24th, and running over six days with temperature varying between 100° and 103 2-5° for five days and then dropping by lysis to normal. The relapse was more severe than the original illness.

Case 5. Private H——. Aged thirty-one; inoculated twice, August, 1915. Illustrates gradual ascent and decline of temperature, while lying in hospital. B. paratyphosus A. isolated from blood January 1st. First symptoms complained of January 2nd, headache, shivering pain in back; epistaxis on 4th. Spleen became palpable; no rose spots. Temperature rose from 100° on first day by steplike daily ascent to 104° on seventh day, and fell by lysis. Duration of illness nineteen days.

Case 6. Private T——. Aged nineteen, inoculated twice, December, 1914. Onset on December 13th, with diarrhœa and headache; about midnight severe abdominal pain. Eight liquid stools during the night.

December 14th. A little better.

December 15th. Very weak, shivering, pain in back and in limbs and abdomen; dizzy; throat dry; reported ill and sent to hospital.

December 18th. On admission face flushed; eyes heavy; tongue dry, coated grey; breath fæcal; giddiness; pain in groins; pain in limbs, very weak; no spots; spleen not palpable; abdomen not distended, but tender; nausea; diarrhœa persists.

December 22nd. Face flushed; expression heavy; breath fæcal; tongue furred white, moist; no headache; back and limbs ache; diarrhœa persists. Five stools daily; abdomen soft, not distended or tender; condition improving.

December 26th. Condition worse; looks ill; restless; feels very weak; diarrhœa troublesome; tongue dry, furred; no rose spots; spleen not palpable.

December 30th. Apathetic; sleeps much; tongue dry, coated brown; occasional râles in both lungs; no cough; no rose spots; spleen not palpable.

January 5th. Right cheek flushed; tongue furred, moist; hungry; râles in both lungs; no cough or expectoration.

January 10th. Tongue clean, moist; stools firm; very hungry.

B. paratyphosus A. was isolated from blood. Temperature 103° on fifth to eighth day, fell gradually to 100° on eleventh day, rose gradually to 104° on fifteenth day. Then sank gradually to normal, with rises on twenty-second and twenty-eighth day.

Case 7. Private K——. Inoculated twice, October, 1914. Onset: October 26th, off food; chilly; throat hot, parched; causing difficulty in swallowing; abdominal pain. On 27th, diarrhœa began, eight and nine liquid stools; abominal pain very severe; headache and pain in limbs; nausea.

3-11-15. Face slightly flushed; mouth and tongue dry, furred white in centre, red at tip; vomited twice; pulse 98 not dicrotic; temperature 100·8° at 9 p.m.; abdomen distended, tender; gurgling marked; no rose spots; spleen not palpable.

5-11-15. Delirium with hallucinations and delusions, drowsy; tongue heavily coated brown, dry in centre; abdomen distended; not painful; rose spots appearing.

9-11-15. Delirium each night.

14-11-15. Resting well; tongue moist, cleaning in patches; no headache or pain.

22-11-15. Face flushed; circumoval pallor; hungry, stools firm.

6-12-15. Aching pains in toes and soles of feet; sensitive to touch; delusions and slight mental cloudiness.

21-12-15. Recrudescence of temperature for several days, temperature 99°-102°. Evacuated to base.

B. paratyphosus B. isolated from blood.

Case 10. Private C——. Aged twenty-nine, inoculated twice on August 14th. Prodromal symptoms for two or three weeks; feeling seedy; off food; occasional headache and slight pain in hips.

Onset 12-12-15. Headache, shivering, pain in back, weakness; next day symptoms worse; limbs aching. Reported on 14th, and admitted to hospital.

B. paratyphosus A. isolated from blood. Temperature 103° on third day, dropped by lysis to normal on the tenth day.

Case 11. Private McG——. Inoculated twice, March, 1915. Onset about November 6th, with diarrhœa.

November 8th. Severe abdominal pain, anorexia, headache, pain in back and limbs, chilliness, sweating, weakness, dizziness. In bed for two weeks before admission to hospital.

B. paratyphosus A. isolated from blood. Duration of illness thirty-eight days. Prolonged continued fever.

Case 12. Dr. H——. Inoculated twice, November, 1915. Onset while convalescing from dysentery, temperature being normal, and stools formed, one daily. Onset sudden December 3rd, temperature at 6 p.m., 98·6°; a few hours after face flushed, headache severe; shivering; hot later.

December 4th. Temperature 103·4° at 6·30 a.m.; limbs aching (for this day only); headache ceased permanently; backache (this day only); no abdominal pain or diarrhœa.

December 14th. Face flushed bright red; eyes injected; tongue coated; mouth breathing; mouth and throat dry; abdomen tumid; spleen enlarged, tender; several rose spots on chest; marked tenderness of skin over kidney areas, tends to sleep in day time; nervous.

December 21st. Face not flushed, tongue a little dry; white fur; slight cough.

December 29th. Tongue clean, moist; slight cough; feeling well; bright.

B. paratyphoid A. isolated by blood culture. Chart shows high intermittent temperature of septic type. With fall to normal on December 24th, and slight rise (to 101°) on December 31st.

Case 13. Lieutenant P——. Inoculated twice, 1915. Onset sudden, November 25th, p.m.; present at our mess for breakfast and lunch, enjoying food, bright and talkative as usual. At dinner 7.30 p.m., face flushed; expression heavy; quiet; left food unfinished; retired with temperature 103°, headache, slight chilliness. Said he had not been quite himself for a day or two.

November 28th. Headache persistent; chilliness troublesome, epistaxis free; constipation; slight cough.

November 30th. Face flushed; drowsy; dull; articulation slow; breath heavy, sour; tongue heavily furred white, moist.

December 1st. Face less flushed; tongue moist, less furred; general improvement; throat dry, stiff; headache relieved for first time; slight cough; had feeling of fulness in epigastrium, rifting gas; no pain; no nausea; has had occasional aching in thighs; feels very weak; no rose spots; spleen not palpable.

Bacillus paratyphosus A. isolated from blood. Chart showed temperature falling by lysis and becoming normal on December 7th.

Case 14. Sergeant N——. Inoculated twice, March, 1915. Admitted November 30th, to hospital.

Illustrates a relapse after prolonged onset and mild primary attack. It might be regarded as the primary attack, preceded by the symptoms of a three weeks' onset.

Bacillus paratyphosus A. isolated from blood.

Case 15. Sergeant B——. Inoculated twice, December, 1914. Illustrates sudden onset of paratyphosus A. while lying in bed, with very mild symptoms. Admitted for thrombosis of left popliteal vein. At night December 18th, a little hot and restless, later slight chilliness; sponged by sister at midnight and slept quietly. Slight headache next a.m. for two hours, passing off to return no more.

December 17th. Slight cough.

December 20th. Temperature 104°.

December 23rd. Epistaxis.

December 26th. Stools liquid, four daily.

December 27th. Face not flushed; tongue furred dirty white; no mental disturbance; throat dry; rose spots fading; spleen palpable; abdomen tumid; slight tenderness in hypogastrium; cough; moist and dry râles in left lung; no pain.

January 10th. Tongue moist, clean, beefy red; no cough; spleen not palpable; insomnia; hungry.

Bacillus paratyphosus A. isolated from blood.

Case 18. Private B——. Inoculated twice on June, 1915. Onset sudden in night of October 23rd, with headache and abdominal pain.

24–10–15. Unable for work, feeling weak; rested; vomited his tea.

25–10–15. Very weak; slight pain in limbs; admitted to hospital.

26–10–15 Diarrhœa severe, twelve liquid stools p.m.; dizzy; B. paratyphosus B. isolated from blood.

27–10–15. Very dull mentally; face flushed, tongue furred grey, moist; abdomen tumid, very tender in upper zone; diarrhœa severe—soup-like stools, benefited by lead and opium.

28–10–15. Pulse 92 dicrotic; temperature 103·4°; rose spots forming, not elevated; headache severe; much abdominal pain; does not rest at night; abdominal reflexes increased; knee jerks absent; tenderness of lower limbs and skin of abdomen; some cough.

30–10–15. Retention of urine; catheterized; vomited once; abdomen distended and tender all over.

6–11–15. Abdomen tumid, tender; pain in epigrastrium; cough persists.

15–11–15. Cough troublesome; abdomen painful and tender, relieved by heat; rose spots still appearing; spleen never palpable.

17–11–15. Mouth dry, tongue coated grey brown; cough moderating; pulse 55, small, compressible; temperature normal 9 a.m.; stools still fluid; no headache; abdomen very tender throughout; spots palpable, fading.

25–11–15. Spots faded, leaving brown stains; no abdominal tenderness; stools becoming firm; feeling well; tongue almost clean, moist, face pale.

9–12–15. Recrudescence during last five days; temperature 99°-100° headache, sweating, constipated.

23–12–15. Allowed up for first time, convalescing well.

Case 21. Private C——. Never inoculated. Onset December 8th, p.m., sudden with severe headache; pain in back and across front of chest; marked chills with sweats; weakness of legs.

December 15th. Face flushed; eyes injected; breath fæcal; tongue dry, two lateral strips of fur; mouth breathing; not somnolent; numerous rose spots on front and back extending on to arms and legs; spleen not palpable; dry râles in chest; diarrhœa for one day only.

December 21st. Face flushed; expression heavy; drowsy; respirations 24; tongue dry, glazed; hearing defective; spleen enlarged; dry râles in lungs.

December 29th. Tongue moist; no cough; deafness persists; no pain or discomfort.

January 10th. Flush gone; face pale; tongue clean, moist, feels well.

B. paratyphosus A. isolated from blood. The temperature ranged in this case very high touching 106° on December 9th and 105° on December 11th.

Case 22. Private R——. Inoculated twice in 1915. Onset sudden, November 4th, about 6 p.m. No supper; severe headache; aching in limbs and back; chilliness; cough and sore throat; slept poorly.

November 5th. Symptoms worse; dizzy; reported ill.

November 11th. Face flushed; expression dull, tongue dry, fissured, furred along borders; sordes; headache; abdomen tumid, not painful; spleen palpable; rose spots appearing.

November 13th. Face flushed, swollen; eyes expressionless; headache and aching pains in back, chest and limbs all diminishing; knee jerks and abdominal reflexes not elicited; abdomen slightly tender; stools fluid; pulse 104° temperature 103·7° at 6 p.m.

November 15th. Hæmorrhage free—red fluid and clots. Temperature fell from 102° to 98 3-5°; pulse 104.

November 16th. Abdomen not distended, not tender; spleen palpable; tongue dry, scaling, fissured; no headache; back and limbs ache; pulse dicrotic;

November 25th. Much reduced, pale, thin, weak.

December 2nd. Greatly improved; convalescing well.

B. paratyphosus B. isolated from blood in stool.

Case 23. Private N——. Inoculated twice, 1915. Onset 27–10–15. Sudden on rising; dizziness, headache; diarrhœa. Next day symptoms more severe, reported ill.

3–11–15. Face flushed; no vomiting or abdominal pain to date; tongue heavily furred grey, dry; sordes; abdomen tumid; spleen palpable, tender; no spots.

7–11–15. Tongue dry, coated; numerous rose spots; cloud of albumen in urine.

12–11–15 Tongue caked, fissured; mouth very dry; stools liquid; pulse 60, temperature 99·7° at 11 a.m.

16–11–15. Tongue moist; fur diminished; new crop of rose spots appearing.

23–11–15. Tissues much wasted; tongue furred, moist; one stool daily, semi-fluid; enjoys food.

12–12–15. Feeling very weak; serum agglutinates Bacillus paratyphosus B. completely in dilutions 1: 200; no agglutination of paratyphosus A.

Blood culture was sterile.

22–12–15. Has had four recrudescences of temperature without appreciable symptoms; taking nourishment well and gaining in flesh; feeling well.

Case 24. Private M——. Inoculated twice in June, 1915. Onset sudden on December 14th, headache and pain in limbs.

December 17th. Admitted as appendicitis. Headache, abdominal pain, more marked in lower zone; constipation.

December 19th. Tongue moist, furred; headache; pain in abdomen, tenderness in right iliac area; constipation; pain in limbs; bronchitis; no rose spots; spleen not palpable. Blood culture done; B. paratyphosus A. isolated.

December 22nd. Signs of peritonitis; operation revealed two perforated ulcers in lower ileum, and a third almost perforated.

December 24th. Repeated copious hæmorrhages per rectum; death.

SOME CLINICAL ASPECTS OF ACUTE ANTERIOR POLIOMYELITIS*

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THE recent observations and researches in acute anterior poliomyelitis have essentially modified our conception of that disease, and have demonstrated the need of totally reconstructing our ideas on the subject. The name, infantile paralysis, is in itself faulty, for neither is the disease confined to infants, nor do epidemics show that even the very large proportion of the cases are accompanied by paralysis.

Evidence is abundant that the disease affects all ages and classes, and that in so many cases is paralysis absent that one has been tempted in following out the older conception to designate the disease as typical, or atypical according as paralysis is present or not.

The picture of the disease, as painted by Charcot, may now be regarded as obsolete, for very many cases of the "atypical" variety occur with general or local signs only, and devoid entirely of the paralytic condition which the great French neurologist considered as essential to the diagnosis.

Infection. The disease is essentially infectious and communicable. Experimentally its communicability has been proven with monkeys, and has been amply demonstrated in the human through clinical observation.

There seems to be little doubt that the germ as described by Flexner is the cause of the disease, although quite recently Rosenow claims to have discovered a different organism which invades the system through the tonsils. The virus apparently affects chiefly the central nervous system, and enters the body through the mucous membranes of the nose, the throat and the intestines, and is present to a less extent in the other viscera. It has not been found in the blood.

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The upper respiratory passages are the main focus of infection and the virus is discharged in the secretions. It has been shown, too, that *healthy* persons who are contaminated can similarly convey the secretions from *their* mucous membranes, and further that the virus when experimentally inoculated into the abdomen, the blood, or the brain, also leaves the body by means of the secretions of the respiratory passages.

As in other infectious diseases, so here an incubation period exists, the average duration being eight days.

In experimental monkeys, on the other hand, the limits are wider—from three to forty-six days.

The mode of infection is undoubtedly by personal contact, and convincing evidence has demonstrated that no intermediate way exists; in other words, flies and domestic animals do not communicate the disease except in the rôle of passive carriers. The theory that stable flies conveyed the virus by contaminating the blood is untenable, for the mere reason that no one has yet discovered the virus in the human blood.

The *period of infectivity*, except in the case of chronic carriers, lasts approximately six weeks, but it is also noteworthy that susceptibility of various individuals is by no means identical.

As has been demonstrated in the case of diphtheria by the Shick test, so here in epidemic poliomyelitis, it is certain that many people have a *natural immunity* to the disease. It is in this way that one can explain how frequently in a large family only one person is affected with the disease, though, as a matter of fact, if careful enquiry were made, it would often be shown that others in the family have suffered from atypical and mild forms of the malady. The fact that, after all, only a small proportion of children are susceptible to the disease, should in some way palliate the fear that exists of the terrible consequences of an epidemic.

Immunity is conferred by one attack, and only rare instances exist to the contrary.

Immune bodies have been found in the blood after twenty years, irrespective of whether the attack was mild or severe.

Various stages exist, sometimes designated as (1) Prodromal, (2) Preparalytic, (3) Paralytic, or paretic, and (4) Final stage (in which the disease has ceased to spread).

The prodromal stage (so-called), varies in intensity and duration. It may be entirely absent, as in the case of over-night paralyses, or, on the other hand, may last over days or weeks.

Its essential clinical features are indefinite body pains, fatigue, and pressure or aching in the head.

The real onset is ushered in with fever, and in most cases is sudden. A rigor is rare, and the previous health is usually described as good. The Vermont statistics of the previous health of 285 patients in their epidemic are of interest.

Of these, in 170, previous health was excellent.
97, previous health was good.
18, previous health was poor.

Total.....285

The fever is usually high at the onset, from 101° to 104°, and is of short duration, running to days rather than weeks, and its cessation occurs by lysis rather than by crisis.

There is a cerebral form, however, with high fever, in which a crisis sometimes occurs.

Of the *general symptoms* the following may be noted—malaise with headache, vomiting, constipation (rather than diarrhœa), pains irregularly distributed over the body, but especially in the nape of the neck. The head and neck are held stiff, the patient refusing to flex his chin upon his chest, and the pain is increased on passive flexion (usually the patient is found lying on his side to protect his neck); the jaw not infrequently drops. Hyperæsthesia is a characteristic symptom, and is of three types—cutaneous or superficial, muscular or deep, and muscular on movement. The hyperæsthesia is diffuse as a rule, and if localized it would indicate that this part is about to be paralyzed.

The legs and the spine are seats of election for these disturbances, as is also the abdomen. Spontaneous pain is doubted by many who believe these pains to be essentially due to muscular movement, or friction pressure.

Weakness is another characteristic feature. There is flaccidity of all the muscles, and sometimes there are involuntary jerky movements of those muscles which are about to be paralyzed.

Drowsiness was noted in many cases of the recent epidemic in New York. Such patients were easily aroused for a moment, became quite mentally alert, or irritable, and then lapsed into their former apathy. Delirium and convulsions were rare.

These symptoms which last from five to ten days, may end the clinical picture, and any previous preëxisting muscle weakness may recover with unusual rapidity. These, then, are the cases to which the term "*abortive*" has been applied, i.e. recovery occurs without injury to the motor apparatus.

The predominant signs may be gastro-intestinal, and the disease may be ushered in by anorexia, nausea, and vomiting, or the influenzal type may occur with coryzal symptoms, accompanied by muscular pains, arthralgias, headaches, and general depression. Or, again, there may be anginal signs, sometimes with an acute tonsilitis, or even a middle ear disease.

It not infrequently happens that after cessation of these general symptoms, recurrence may follow with a subsequent paralysis.

The Cerebral or Polioencephalitic Form. The existence of this in its pure form, i.e. with spastic paralysis, is denied by many, and, as a matter of fact, it usually is associated clinically with the meningeal variety. The meninges of the brain and cord are usually both involved, and it is hard to differentiate between the two. In this form the acute symptoms appear early. There is antero-posterior stiffness and increased rigidity of the neck, and painful flexion. Brudzinski's, Kernig's and MacEwen's signs are often present. There is drowsiness, extreme hyperæsthesia, and increase of the tendon reflexes. With these symptoms there may be basal meningeal signs (ocular or facial palsies, or monoparesis), or, again, there may be optic neuritis and hæmorrhages into the retina. Most of these symptoms may be transient, or permanent, and if convalescence occurs a dynamic or static ataxia may remain. In these cases the paralysis may occur on the second day, or after the second week.

In addition to the above, many other symptoms may occur indicative of a cerebral lesion—dizziness, nystagmus, narrowing of the pupils, narrowing of the lid cleft, paræsthesia, diminished sensation, tremor of the tongue, herpes, and slowing of the pulse.

Any, or all, of the above symptoms may happen without paralysis, or, on the other hand, may progress and the virus may cause widespread or focal changes in the nervous system from the cortex to the most distant peripheral nerves. The liability of dissemination of the virus is what causes its variegated picture, and it is for this reason that Wickham has classified his types according to the focus of the nervous system involved.

Bulbar-Pontine Type. In this variety the motor neurone is involved, and flaccid paralysis occurs. Here, as in other forms of the disease acute signs of infection present themselves. There are great myasthenia, tremor, and isolated lesions of the nerves, or, again, there may be grouping of symptoms where several cranial nerves are involved together.

Dysphagia, dysarthria, dyspnœa, all occur according to the nerves involved, which affect the palate, tongue, pharynx, diaphragm, or serratus muscle. Some of these cases are diagnosed as croup, others as acute pneumonia. Rapidly ascending paralysis in these cases affords the greatest menace to life, though as a rule if patients escape for ten days, there is no further fear of death.

The Spinal or Bulbo-spinal type. Here, again, the lower motor neurone is infected and the paralysis is flaccid. This is the commonest of all varieties. In some cases the onset is afebrile and the paralysis comes quickly (over-night), and there may be complete paralysis of a limb, or paresis, or merely a weakness of the muscles.

The changes occur quickly, and for that reason frequent examinations are necessary both for diagnosis and prognosis.

The distribution of the paralysis is very irregular—it may be diffuse or local. All the muscles of a limb may be involved, or only groups, or, again, a single muscle may be attacked.

It is well to test the attitude of the patient as a whole, to test for his tonus, and to examine carefully the muscles of the neck, back, and the abdominal wall. Sensory disturbances of this type are due to lesions of the ganglia of the posterior roots, as has been demonstrated experimentally in monkeys.

The Abortive Type. This is by far the most important and dangerous form of the disease, for it is from these cases that infections are so frequently carried, and epidemics maintained. Thirty-five per cent. to 56 per cent. of all cases are abortive in type, and occur with general symptoms devoid of paralysis, or with transient paralysis, or paresis; or, again, the disease may run a course of several weeks, resembling a tuberculous meningitis.

There is no doubt that in all epidemics, patients, who have been exposed to infection, often acquire the disease, showing merely, however, indefinite signs of some general infection and unexplained temperature. These are the cases which become dangerous, and in whom, until the recent epidemic, there was no suspicion of the disease.

The Diagnosis. The following features are of importance in the diagnosis. The essential feature is an acute infection of the central nervous system. A flaccid paralysis is not essential to the disease—it may be entirely absent, or merely transitory—in other words, there occurs a sudden onset of a febrile disease to which are superadded certain nervous symptoms. Of these the most important are hyperæsthesia and pains. There is usually stiffness of the neck with pain on passive movement, as well as unwillingness to flex the neck upon the sternum. Drowsiness is common in the early stages of the disease, and may be the most striking feature. Careful examination should be made for evidence of paresis, or of some weakness of the extremities and the trunk. Brudzinski, MacEwen and Kernig signs should be looked for, and lumbar puncture should be made in all cases as being often of great value in the diagnosis.

The Lumbar Puncture. As a rule, the fluid flows out under normal pressure. In the early stages the fluid is clear and abundant, and the fibrin-web is well formed.

Fehling's reaction may be positive. Globulin tests may also be slightly positive. The cell count is usually under 100, and 80 per cent. of the cells are mononuclears, in which the large varieties predominate.

In some cases the fluid is cloudy, with predominance of polynuclear cells. Blood is rarely present, except in cases of trauma. The fluid is to be differentiated from that of cerebral spinal meningitis, where it is cloudy early in the disease, with more albumen, more globulin, and less sugar, and 90 per cent. of the cells are polynuclear. The meningococcus, of course, which is easily found, aids still more definitely in the differentiation. It is more difficult, however, to distinguish between the fluids of tuberculous meningitis, and those of poliomyelitis, more especially as in both instances the fluid may shew no distinctive features.

The Differential Diagnosis, especially in epidemics, deals, first, with other diseases of a general or infectious type, in which an acute febrile onset occurs and, secondly, those diseases in which involvement of the nervous system predominate.

One must thus differentiate this disease from tonsilitis, influenza, acute rheumatic fever, pneumonia, toxæmia, gastro-intestinal infections, and various forms of meningitis.

Typhoid-, or pseudo-meningism, must also be considered, while palsies during a local epidemic are always to be regarded as probable instances of acute anterior-poliomyelitis.

In a disease, then, which occurs at all ages, among all classes, and even at all seasons of the year, though especially in summer, one learns from the recent epidemics how important it is to recognize, firstly, that not all people are susceptible; secondly, that the disease may occur in the most atypical forms without developing paralysis—that such cases are the greatest menace to the public health,—and that during epidemics every person with an acute infection is rightly to be regarded as a suspect, if the welfare of the community is to be respected.

POLIOMYELITIS AS SEEN BY THE SURGEON

By Lieutenant-Colonel A. Mackenzie Forbes, M.D., C.M.

Children's Memorial Hospital, Montreal

ACUTE poliomyelitis has been defined by Osler as "an affection occurring most commonly within the first three years of life, characterized by fever, loss of power in certain muscles, and rapid atrophy". By statistics it has been shown that next to rachitis, poliomyelitis is the most prolific source of deformity, and of deformity which never disappears spontaneously.

Observations made at the Children's Memorial Hospital, Montreal, suggest that it is a disease which, although occurring most frequently within the first three years of life, is not extremely uncommon even up to adult life; that frequently there is a history of an acute febrile onset followed by paralyses and paresis in single muscles or groups of muscles. These paralyses usually attain their maximum intensity at once, or almost at once. Quite as frequently, however, there can be elicited no history of a premonitory febrile attack, but, rather, the history of a slight, perhaps progressive, loss of power in certain muscles, or groups of muscles, which have become noticeable to the friends of a patient who previously was supposed to be in perfect health and condition. In both classes of cases atrophy is soon noticed, and is accompanied quite frequently by deformities of various forms.

Recent Studies. The etiology of this affection has been carefully studied especially within recent years. Amongst the most interesting works on this subject is that undertaken in the Rockefeller Institute, notably by Flexner and his associates. Of special suggestion are the studies of Flexner and Noguchi of a minute parasite of globoid character.

Flexner and Clarke have shown experimentally that when the virus of poliomyelitis is introduced into the upper nasal mucosa in monkeys its propagation can be followed from the olfactory lobes of the brain to the medula oblongata and spinal cord. Another point of interest, which has been demonstrated at the Rockefeller Institute, is the relatively great difficulty of infecting monkeys with the virus of poliomyelitis by introducing it directly into the blood, but it has been demonstrated positively that experimentally the virus of poliomyelitis introduced into the blood may pass indirectly by way of the cerebro-spinal fluid into the interstices of the central nervous organs. To reach the cerebro-spinal fluid the virus must first penetrate the barrier of the choroid plexus which operation requires time.

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*Read in part at a Symposium on Poliomyelitis held at Montreal Medico-Chirurgical Society, October, 1916.

Paul F. Clarke and H. M. Amos have drawn attention to the lack of agreement as to the manner in which the lesions are produced; namely, whether through direct action of the virus upon the nerve cells or through indirect effect of lesions in the blood vessels and ground substance. They say: the hypothesis that poliomyelitis is a specific affection of the anterior grey matter of the spinal cord has been abandoned. The lesions occur regularly through the structure of the cord including the intervertebral ganglia, frequently in the medulla and brain and quite often in the Gasserian and abdominal sympathetic ganglia.

Flexner has emphasized the naso-pharyngeal mode of infection in poliomyelitis and, according to his view, virus ascends probably by way of the lymphatics from the nasal mucous membrane and multiplies in the pia-arachnoid membranes and the adjacent nervous structure of the brain before becoming established in the medulla and spinal cord.

Clarke and Amos say: the constant involvement of the pia-arachnoid membranes in poliomyelitis, even when no paralysis occurs, and the fact that infection can readily be produced by the intraspinous inoculation suggests anew that in the pathogenesis of poliomyelitis the interstitial tissue changes within the meninges, blood vessels, and ground substance play a determining part.

Clarke, Fraser and Amos have studied the subject of the relation to the blood of the virus of poliomyelitis and stated that it is of more than theoretical interest, as it may have a bearing on the manner of transmission of the disease. On that account they carried out a large series of experiments in order to determine as far as possible this relationship. Experimenting on monkeys, after the first week of acute illness immune bodies which have a neutralizing effect on the virus appear in the blood and it is not improbable that by acting on the virus (human), originally of low infective power for monkeys, they may further diminish the chances of producing paralysis. Continuing their experiments they conclude that it would appear that only when the blood is overwhelmed by the virus is it certainly infectious over a period of three days or less. Further they state that infection is accomplished less readily through the circulation than by the more direct lymphatic and nervous channels in communication with the central nervous system.

Flexner, Clarke and Fraser (*Journal American Medical Association*, January, 1913) state: Aside from infected persons and monkeys the virus has once been found in external nature: namely, in sweepings obtained from a room in which cases of poliomeylitis had recently been kept (Neustaedter and Thro). This latter finding indicates that the virus is capable of leaving the infected body in a manner that permits of its persistence as dust. Since the virus has been shown to occur frequently, if not constantly, in the discharges of the nose and throat, it is clear that it must escape into the surroundings of the infected, where, when dried, it would retain its activity for a considerable period of time. Clinical observation has awarded a definite rôle to healthy human carriers of the poliomyelitis infection, but thus far indubitable experimental demonstration of the occurrence of such passive carriers has not been furnished. The above mentioned investigators quote the history of a child dying of poliomyelitis where washings were collected from the naso-pharynx of both father and mother. This fluid was introduced into a monkey which died exhibiting characteristic pathological signs of poliomyelitis. An emulsion of a glycerinated spinal cord of this monkey was injected into a second monkey which, in its turn, showed typical signs of poliomyelitis. These authors then say that these experiments leave no doubt that the washing from the naso-pharynx of the parents of this child, neither of whom showed any symptoms of illness and were evidently not suffering from the disease, contained the virus of epidemic poliomyelitis. They say the result described brings indubitable evidence of the occurrence of the virus of the disease in the naso-pharynx of healthy persons who have been in close contact with an acute case of poliomyelitis and affords an experimental basis for the belief, based upon clinical observation, of the occurrence of passive human carriers of the infection.

Morbid Anatomy. Originally it was felt that this disease was due to an acute inflammation in the anterior cornua of the spinal cord. This inflammation causes, or is accompanied by, a large amount of small round-cell exudation, hæmorrhages, and thrombosis of vessels. It is followed by necrosis, and finally by cicatrization. Our views have been considerably modified of late. To-day all writers accentuate the fact that all parts of the cord and indeed the surrounding tissues are affected.

From a purely surgical point of view the important lesions of a pathological nature to be remembered are the swelling and congestion of the purely nervous elements with marked interstitial changes in the cord generally and a co-incident inflammation in the adjacent coverings of the cord. These changes are followed by degeneration of nerve cells and nerve filaments. This, no doubt, is the cause of the permanent paralyses resulting.

Clinical Aspects. With or without slight indisposition or feverishness the patient loses the use of one or more groups of muscles. Convulsions at the onset are rare, not usual, as in the acute infantile hemiplegias. Fever although generally, or perhaps always present, may not be noticed. Pain and tenderness in the affected limbs are frequent in those cases with an acute onset, where, also, the paralysis soon reaches its maximum, usually in a few hours. In some cases the pain may persist for weeks. The severity of the pain is said to depend upon the amount of involvement of the meninges. It has been noted that it is especially acute on motion suggesting indeed the pains of an arthritis.

The paralysis is usually at its height in a few hours although in some cases it may be a week or ten days before it is noticed. The paralysis, of course, is typical of the flaccid variety. At the same time it has been suggested that in the very early stages before the actual onset of the paralysis there may be a hypertonicity due to irritation of the nerve cells. The paralyses are irregular in distribution. The distribution of the paralysis follows no rule. The lower extremities are most frequently affected. In over 80 per cent. of cases one or both lower extremities are involved. The paralyses are followed by deformities, which are due to

1. Permanent paralyses due to death of nerve cells.
2. Temporary paralyses due to pressure on, or interference with, nerve cells.
3. Pseudo paralyses due to stretching of muscles and tendons.
4. Contractions due to unopposed muscular tone.

To understand the incidence of these four etiological factors in the production of the deformities following polomyelitis let us take a typical case. A patient suffers the initial invasion of the virus causing poliomyelitis which may or may not give rise to fever and other symptoms, but which invasion is characterized by certain definite findings. This patient may next show clinical loss of function of the flexors of the foot with a resulting foot drop. Now this foot drop at this time may be due to two distinct lesions of the nervous system. It may be due, to a minor degree to death of nerve cells in the anterior horns, or it is probably, to a greater extent, due to lesions outside the cells of the anterior horns, which extra cellular lesions cause a temporary or pseudo paralysis. Thus, the typical deformity under consideration is to a greater extent due to a paralysis which is temporary than to a paralysis which is permanent.

The importance of this point is that we can give at this stage a hopeful yet guarded prognosis for improvement.

Following this patient further we notice that this, the first stage of the deformity and the second stage of the affection, is followed by a period of REGENERATION. In this, nerve cells, which have suffered loss of function but not death, resume their function. Infiltration, peri-vascular and interstitial changes, as well as other toxic conditions, cease to exert the paralyzing influence first seen. This period of regeneration is of long duration. By some authorities it is said to last for a year. By other authorities it is said to last for two years.

Treatment. Operative procedures undertaken to compensate for deformities directly due to paralyses should not be undertaken during the period of regeneration. If any operative procedures are undertaken during this period they should be directed, only, to the relief of deformities due to lack of muscular balance. On the other hand protective surgical treatment is most highly important during this period. Here exercises, electricity and massage may be useful, especially at a later date, but most important is the supportive treatment secured by the use first of plaster of Paris and later of light braces which are capable of preventing muscular stretching and contraction due to loss of balance.

If protective treatment be neglected during this period of regeneration there will be a great tendency to degeneration—degeneration not of nerve but of muscle and tendon which is due entirely to stretching and disuse. Unless protective treatment is assured whilst the initial central lesion is improving, contraction from unopposed muscular tone, or lack of balance, leads to organic muscular shortening and thus such deformities as equinus suggested in the typical case already used to illustrate these points.

For those organic deformities due to contractures, during the period of regeneration, fasciotomies, tenotomies and tendon lengthenings are indicated. These are the only operative procedures which are ordinarily allowable during the first two years after the paralysis.

After this period the deformities due to actual paralysis may remain. It is for these that tendon transplantations and operations on bone are indicated. Many and various operative procedures have been suggested for the relief of these deformities. All of these operations have their distinct places in the surgical treatment of poliomyelitis and any of these when employed in properly selected cases tend at least to benefit, if not to cure, by readjusting the muscular balance of the affected parts.

ANNOUNCEMENT is made of the appearance of a medical publication entitled *Medicine and Surgery*, edited by Dr. Philip Skrainka, of St. Louis, Missouri, who for the past six years has been the Literary Editor of the *Interstate Medical Journal.*

AN ophthalmological service has been added to the other departments of Bellevue Hospital, New York. It is situated in the new surgical pavilion but is entirely distinct from the rest of the hospital, having its own operating, examining and dressing rooms, a staff of attending surgeons, special internes and nurses; its capacity for the present will be fifty beds. The service is in charge of Dr. Charles H. May, attending surgeon, who will have as his principal assistants Drs. John M. Wheeler and Julius Wolff.

THE ADVANTAGES OF EARLY SANATORIUM TREATMENT

By David Townsend, M. D.

Superintendent Jordan Memorial Sanatorium, River Glade, N.B.

TUBERCULOSIS depends not only upon infection but on reduced constitutional resistance, due sometimes to acute illness or injury, but more often upon unfortunate habits, unfavourable conditions of life, and improper home conditions.

In the treatment of tuberculosis, it is essential, for the best results, that the cases be obtained in as early a stage as possible. The earlier the case, in most instances, the better the result. In order to get these cases education of the public is important. An individual who has been told that he has the disease should believe the physician. Because he feels well and looks well and healthy, is no excuse for putting off treatment until he does feel ill or thinks that he needs treatment, when it may be too late. The friends and family need the education just as much as the patient, too often one hears, "there is nothing the matter with you, you look strong and healthy, you are only lazy," even after the individual has been told by a physician that there is a focus or infected area in the lung or lungs.

In this connexion I would like to urge that every physician give the patient the benefit of the doubt. If there is any suspicion of the disease, the patient should be placed under proper supervision and treatment at once; no harm is done, for the fundamental principles of the treatment of tuberculosis are of as much value in any disease as in tuberculosis. These cases should take a course in a well regulated sanatorium, if for no other reason than for the teaching of how to live properly in order to remain well and for the education of life. Such cases can be more closely watched and every symptom more carefully observed in a sanatorium, than at home. In this way many a case can be prevented from becoming advanced. To wait until the disease is well seated or evident is an injustice, to

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say the least, to the patient and the community, as well as an added expense.

Treatment for the majority of cases is best carried out in the sanatorium. Here the patient is taught his limitations, what the disease means and how to prevent spreading the infection, thus protecting others. The patients are under the watchful eye of a physician, specially trained in the disease, and nurses, trained for the work, and who should be chosen for their force of character and personality. Every symptom is carefully analyzed and those patients who need encouragement are encouraged, those who need to be cautioned are cautioned, and those who need to be reprimanded are reprimanded. The time to relieve worries and anxieties on the part of the patient is now, not to-morrow or next week, and in this way symptoms may be explained at once, and many a molehill prevented from becoming a mountain. Tuberculous patients require a social visit for the best results, not a medical visit. This requires time on the part of the physician and can only be best obtained in the sanatorium. The vital principle of treatment is constant personal supervision of the daily life and careful study, by the physician, of the innermost life of each patient. He should be their friend, confessor and physician. Such a condition can only exist in a sanatorium. The physician and patient are constantly in close touch with each other, which results in mutual benefit. The physician in charge of a sanatorium, for the best results, should be a man who has studied human nature, one who knows individuals and knows from personal observation, what a patient will or will not do. In this way only is he able to start the patient on the right road and this right start from the beginning is essential. It is most important to keep up the courage of the patient. In most instances one with tuberculosis has to begin life anew. He comes face to face with the realities of life for the first time. We know that the mind is a great factor in overcoming the disease. In the sanatorium, with all the powerful machinery at its command, these factors can be carefully directed and regulated, with the result of awakening latent forces of character and sending out into the world the individual with an increased self reliance and power to do good. A new lease of life is given him and with the renewed faith in life and all its realities he becomes a better citizen and a power for good in the community in which he lives. He becomes a missionary, as well, spreading the gospel of true and righteous living and helping many a poor downcast who may have lost faith in himself and the world, as a result of the disease; and encourages him to take advantage of the opportunities offered by the sanatorium before it is too late. New habits for good are formed and cleaner lives result. In this connexion, as a part of sanatorium treatment, attention to the needs of the various religious denominations are essential. Pastors of the various faiths should be invited to visit the sanatorium, at more or less stated intervals and minister to the spiritual wants of their people. The benefit from such attention is far greater than we realize.

The sanatorium is a school, where the patient is taught not only how to conduct himself for the present, in order to get well, but also in the future, in order to remain well. For the majority of patients it is impossible to carry on treatment properly at home or to provide the conditions necessary for successful results. Many factors enter into this treatment and it can only be intelligently carried out under sanatorium conditions, where each department is under trained service. Persons over each department should be carefully selected for those qualities which command respect and inspire confidence, not only on the part of the patient, but of the community as well.

By treating numbers together there is a reduction in the cost of what it would be were each treated separately at home. In the restoration of the individual to health and strength, as well as to wage-earning power, there is a saving in the monetary loss to the community.

The aim of the treatment, as is well known, is to produce the formation of antibodies and reduce the autoinoculation, thereby assisting nature; this can only be satisfactorily done in a sanatorium, as in such a place is it only possible to direct intelligently the factors which go to make up this end. For the best results, treatment should be undertaken early, while the disease is in the early stages. In a sanatorium the personal element enters largely into the result desired. One patient sees another getting well, it is an incentive for him to do likewise. This applies particularly to the early cases, as these individuals are more susceptible to impressions than those who are more seriously ill and have lost all interest in life and its surroundings. In the early stages, patients can be more satisfactorily taught to form useful habits and the damaged parts are the more readily healed.

Under the stimulating effect of the sanatorium, with its ideal surroundings of quietude, pure air, free from contaminating dust and dirt, good food carefully selected and properly cooked, the freedom from all irritating influences and the careful medical and nursing supervision, there is a rapid diminution in the symptoms. Elevations of temperature, with rest mental as well as physical, and the invigorating atmosphere, soon become normal; the pulse rapidly quiets down and the system the more quickly assimilates the nourishing diet, and nature is thereby assisted to a greater degree than is possible in the home, with all its disturbing influences. Cough and expectoration soon dwindle to insignificance and shortly disappear completely. As a result improvement and eventual recovery takes place earlier than it would be possible under other conditions. There is the stimulus of hope and the encouragement which results from the steady progress and sympathetic attention. As recovery progresses, the graduated and increasing exercise, so essential in order to restore one to the degree of health which will enable him again to take up his former duties, if not completely, at least in part, is scientifically arranged under the watchful eye of the physician, so that the greatest possible benefit is obtained in the shortest possible time. Every nerve is strained and all energy directed to this end, so that there are no serious setbacks and treatment is not prolonged unnecessarily.

To sum up, the advantages of early sanatorium treatment are:

Careful supervision, by specially trained experts, of the life of the individual, resulting in a more speedy recovery.

Reduction of the cost of such treatment.

Reduction of the monetary loss to the community, as a result of the restoration to health.

The formation of new healthy habits and character.

The teaching of the realities of life, tending to make better citizens and improved civilization.

The creation of missionaries, who spread the gospel of true living in the community in which they live, who ferret out the early cases and persuade them to take advantage of the benefits provided by the sanatorium before it is too late.

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DISLOCATIONS OF THE SPINE

By C. E. Smyth, M.D.

Medicine Hat, Alberta.

DISLOCATIONS of the spine consist of displacements forward, partial or complete, of a vertebra with the spine above it.

A Pure Dislocation can only occur in the cervical region, and even here it is not uncommonly associated with fracture.

In the dorsal and lumbar regions it is always associated with fracture, as in the dorsal region the articular processes are nearly vertical looking forward and backward, while in the lumbar region they are also nearly vertical looking inward and outward; making a dislocation without fracture impossible.

In the cervical region, they are nearly horizontal, hence the comparative ease with which a dislocation may occur without fracture.

A dislocation may occur in any part of the cervical spine. The occiput has been displaced from the atlas, with a fatal result always.

The atlas has been displaced from the axis from accidents or in hanging. Usually the odontoid process has been fractured or the transverse ligament torn, and death occurred from compression and laceration of the cord.

Lateral displacement behind these two bones has been recorded, and the result has not been so serious.

Displacement may also occur between any two of the lower five cervical vertebræ, and has been most frequently observed between the fifth and sixth.

It may be unilateral or bilateral. The latter always the more serious.

In either case there is associated laceration of the intervertebral discs and ligaments, and damage to a greater or less extent from laceration and compression to the cord.

The *cause* of cervical displacement is usually a fall, or blow on top of the head with the head flexed. It may also occur from hyper-extension, as in hanging.

The *symptoms* are as follows:

There is a marked rigidity of the neck. Pain is complained

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of in the neck. It radiates down to the shoulders, and is worse on attempted movement of the head.

The symptoms of cord injury vary according to whether the dislocation is unilateral or bilateral, and in proportion to the amount of laceration and compression.

In unilateral dislocation there may only be tingling and numbness along the course of the cervical nerves, or there may be complete paralysis of both arms and legs.

In bilateral dislocation there is always paralysis, varying in degree and extent with the cord injury.

TREATMENT: Reduction by extension and manipulation under general anæsthesia is recommended by all authorities.

Operative reduction is not mentioned unless associated with fracture. In the case recorded below, I failed to reduce the dislocation by manipulation and extension, but succeeded by operation.

I believe that by manipulation, one is apt to increase the damage to the cord, and think that where facilities are at hand, operative reduction is the method of choice. It is certain, and one does less injury to the cord.

I wish to report the following case of unilateral dislocation between the third and fourth cervical vertebræ.

A man aged forty years was admitted to hospital May 13th, 1915, suffering from shock and complete paralysis of both arms and legs. There was marked rigidity of his neck. He was conscious, and complained of severe pain down the back of his neck and shoulders. This was worse on attempted movement of his head. He had retention of urine. A crated buggy had fallen on his head. The *x*-ray showed a dislocation between the third and fourth cervical vertebræ. Reduction was attempted by manipulation and extension under a general anæsthetic. It failed, and the pain was made worse.

He was operated upon May 18th. A vertical incision was made down the back of his neck. The spinous processes and laminæ of the upper cervical spine were bared, and with a periosteal elevator the dislocation, which in this case was unilateral and on the right side, was easily reduced. Loops of bronze wire were fastened around the spinous processes of the third and fourth vertebræ, and the wound closed.

His symptoms immediately following operation were worse. His diaphragm, previously active, was now paralyzed. There was retention of urine, and obstinate constipation. The paralysis of the arms and legs persisted, and his respirations were laboured and frequent.

These symptoms, however, gradually improved, and by May 25th he could move his legs, fingers, hands and forearm. He had also recovered movement of his diaphragm.

On May 29th, his wound was dressed and sutures removed. The wound was healed. On June 2nd, he voided naturally. On June 15th, he sat up in bed. On June 17th, he was out in a chair, and walked on the 23rd, without support. On leaving hospital, June 27th, he walked well alone, and could use his arms well, though there was some weakness of both arms and legs. He could use his head and neck freely.

I would like to urge a resort to operative reduction in these cases, oftener and sooner than has been done in the past.

HAY FEVER

By F. W. Gershaw, M.D. C.M.

Medicine Hat, Alberta

HAY fever is a hypersensibility of certain mucous membranes to a foreign protein and its manifestations are of an anaphylactic nature. It is supposed that the foreign protein is absorbed into the blood and that its products exert a selective action on certain nerve groups, producing engorgement of the conjunctival, nasal and tracheo-bronchial mucous membranes.

It is believed that the bactericidal power of the nasal mucous membrane is due to a proteolytic enzyme. The pollen reaches the nasal mucous membranes of all persons and in most the proteolytic enzyme splits the protein into harmless products. There must be certain conditions which interfere with the normal digestive function and when these arise sufficient protein may be absorbed to lead to sensitization.

Whatever the cause of the disturbance there occurs an intake of foreign protein which so injures the mucous membrane that it remains in a state of increased permeability for the protein, thus when the protein again comes in contact with the mucosa again it is absorbed unchanged.

The presence of hypertrophic rhinitis, polypi, and of other nasal abnormalities is often noted in those subject to this disease.

It is generally stated that there is a neurotic element responsible for the disease but many of those who suffer most from it are anything but neurotic. Hay fever is most prevalent during August and September. Patients have told me that they expected their attack on a certain date, say August 15th, and when the season would be a little later, as this year, they would be perfectly well until, say, August 22nd.

A drive in the country or some unusual exposure is often given as the exciting cause. A smarting, burning and itching is first noted and this is quickly followed by a redness of the eyes and a swelling

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of the conjunctiva of the mucous membrane of the nose and throat. Next comes a profuse watery discharge from the eyes and nose with sneezing, inability to breathe through the nose and general depression.

All of the twenty-nine cases observed this year had eye and nasal symptoms and in about seven cases the mucous membrane of the trachea and bronchial tubes seemed to be most affected, and marked dyspnœa and asthmatic symptoms resulted. Sleep is often interfered with. By staying indoors some relief is obtained and the symptoms subside during rainy weather. The onset of cold weather and frost brings quick relief.

The treatment is rather unsatisfactory.

Adrenalin chloride, 1 in 5,000, applied locally or injected hypodermically, gives temporary relief in about half the cases. Calcium chloride and sodium bicarbonate are recommended.

In cases with hypertrophic rhinitis the cautery should be tried. One case was cured by removing nasal polypi, and one case was greatly relieved by the use of mixed respiratory vaccine early in the season. We used a stock ragweed vaccine in seven cases and four of them seemed to get some relief, i.e., they did not suffer as much as they did on previous years, but the vaccine was not given early enough.

Dunbar's Pollintine is an attempt at passive immunization but has not been very successful. In using a serum derived from a horse for the first time inquiry should be made as to whether the patient experiences asthmatic symptoms when in the neighbourhood of a horse. Sudden death may follow in these cases as it did in one case in my experience after diphtheria antitoxin.

Change of climate gives complete relief in practically every case. A man will have hay fever in Alberta and improve in a day or two by going to Manitoba or British Columbia. The aster, ragweed and golden rod mature in these places about the same time and it may be a difference in species that causes the improvement; if this is the case the pollen used in making a vaccine should be gathered from the neighbourhood in which it is to be used. By making skin tests the particular pollen responsible can be determined and this should be done also in any case where anaphylaxis is feared. Spraying the nose with oil as a prophylactic measure often gives good results.

Case Reports

DIABETES MELLITUS IN A CHILD OF THREE

By Lionel M. Lindsay

Montreal

M. B. was a Hebrew girl of two years and eleven months when admitted to the Children's Memorial Hospital, Montreal. She was the only child of apparently healthy parents, and had been breast-fed for thirteen months. Although never very robust she had had no acute fevers. She was a nervous child and very fond of sweets, in which she had been indulged.

About two months before admission her parents noticed that her health was failing. She became very irritable, lost her appetite except for sweets and drank large quantities of water. She was very constipated.

There was no history of diabetes or neuropathic taint in the family. There was no consanguinity and no evidence of syphilis.

Her Condition on Admission was that of a pale, poorly nourished child. Her skin was loose, dry and harsh. There were no enlarged lymph nodes. Her tongue was dry and coated, her breath had a sweetish odour. The abdomen was scaphoid. The heart and lungs were apparently normal. She was fretful and irritable. Temperature was 100·2°. Weight 26 pounds.

The Urine was clear and pale, 1034, acid, glucose 7 per cent. acetone and diacetic acid (no albumin, no casts).

Although the outlook did not seem promising, it was decided to try a modified form of the Allen Treatment. Consequently she was given a starvation period which lasted sixty-six hours before the urine became sugar-free. During this time she received nothing but water, weak tea (without milk or sugar), and whisky. The absence of any discomfort, hunger or thirst was remarkable. She cried occasionally for "candy". The acetone was if anything less, although we had not the facilities for making a quantitative test, nor did we take the carbon-dioxide tension of the alveolar air, but at no time did she show symptoms of acidosis.

When sugar-free for twenty-four hours she was started with one gram of carbohydrate, and this was increased by one gram every day. This was given in the form of the so-called 5 per cent. and 10 per cent. vegetables, such as well-boiled spinach, cabbage, beets, turnips, etc. On the third day a soft boiled egg was added.

When she was taking five grams of carbohydrate, sugar appeared in the urine. It is difficult to say whether this was due to the carbohydrate in the diet or not. We rather felt that she had surreptitiously obtained food from one of the other children. This brings out one of the difficulties of treating young children, who cannot coöperate with you.

After another twenty-four hours' starvation period she was sugar-free. She was again started with one gram of carbohydrate, and this was daily increased by one gram until she was taking eleven grams, when glycosuria appeared. During this time she was getting a fairly liberal diet of proteins and fats, chiefly in the form of beef, butter, eggs, and bacon.

Another twenty-four hours' starvation rendered the urine sugar-free. This time starting with two grams the carbohydrates were increased by two grams a day until she was getting eight grams and thereafter by one gram or one-half. This time her tolerance reached fifteen grams before glycosuria appeared.

The fourth starvation period was then instituted, lasting twenty-four hours, and the carbohydrates were being increased as in the third period when the child was taken from the hospital. A diet list was given the parents, estimated to allow a maximum of about fifteen grams of carbohydrates in twenty-four hours.

She had been in the hospital forty-seven days. One could hardly say that her general condition had improved very much. She lost about five pounds while under observation. Curiously enough with the disappearance of the glycosuria and the increase in diet her appetite became more and more voracious. At times she had considerable thirst, but as a rule she had little desire for fluids. She passed from 300 to 500 c.c. urine a day. As her habits were not formed some of the urine was occasionally lost.

The tolerance for proteins and fats was not established, but seemed to be comparatively high. It is a question whether we could have further raised her carbohydrate tolerance by continuing as we had started.

Two months later she was readmitted to the Children's Memorial Hospital. A brief part of the interval had been spent in another hospital. Her condition now seemed too desperate to warrant any strict dieting, especially as her appetite was enormous, and she whined continually for food, so that she seemed to be munching bread and butter or fruit every time one saw her. She now passed much larger quantities of urine, which contained from 3 per cent. to 4 per cent. of sugar, and gave a marked reaction for diacetic acid.

Her condition went from bad to worse, she became very weak, fretful and irritable, and finally developed a broncho-pneumonia and died a week later. Permission for autopsy was not granted.

INFANTILE ECZEMA AND STATUS LYMPHATICUS

By Lionel M. Lindsay

Montreal

J. P. two months old, was a healthy, full-termed infant. The only child of apparently healthy parents. He had never been acutely ill, but had gradually developed an eczema on his face and head. He had been breast-fed entirely until two days before admission to the Childrens Memorial Hospital, Montreal, when he had been weaned solely on account of the eruption.

His condition on admission was that of a fine, healthy baby, firm of muscle and mentally bright and active. No abnormality was made out except on the face, head, and neck, where he had the conditions usually found in infantile eczema in the acute stage, with hyperæmia, weeping and crust-formation.

As his stools were not very good he was put on a weak initial formula of protein 1·6: fat O.: sugar 5 per cent. Subsequently this was increased to 1·6: 1·5: 6·5 per cent. His stools were healthy after the first twenty hours, and remained so.

To the eczema was applied a simple form of Lassar's paste (without salicylic acid) on a mask.

Everything seemed to be going well when on the evening of the fourth day after admission he was suddenly seized with a paroxysm of choking and coughing, became dyspnœic and cyanotic, and passed into a convulsion, from which he never recovered.

He died a few hours later, with a temperature of 105°. At autopsy the only abnormality found was a large Thymus gland weighing twenty-five grams. The diagnosis was therefore made of Status Thymolymphaticus.

This case is presented because many books on pediatrics (particularly the German) mention the occasional occurrence of sudden death in infants with eczema, and there is a difference of opinion as to the cause of death in these cases.

Pfaundler and Schlossmann report Feer as stating that sudden death in infants with eczema is not infrequent, and that autopsy reveals nothing but status lymphaticus.

Opposed to this is the statement of Hichens who reports six fatal cases out of twenty-eight admitted to his ward in the Northampton General Hospital. These all died with symptoms of shock and collapse, and had fever of from 103° to 104° at some time. None of these came to autopsy, but he pooh-poohs the idea of status lymphaticus. He also remarks that Gaucher (St. Louis) warned his students against treating cases of eczema in children too energetically owing to the possibility of sudden death.—(*British Journal Children Diseases*. x 117. September, 1913.)

Moro, of Heidelberg, says (in Feer's *Kinderheilkunde*) "occasionally children with eczema suddenly die and without any apparent cause. . . At autopsy many of these show no evidences at all of status lymphaticus, and so we ought to speak of them as acute eczema-death (*Akutem Ekzemtod*)."

The question might naturally be asked whether so-called status lymphaticus predisposes in any way to infantile eczema, or whether there is any relation between these two conditions.

We learn from the *Toronto Star* that since the commencement of the war, approximately 50,000 men from Toronto have joined the colours, or more than one-fifth of all the males in the city at the time war was declared and that of these over 2,000 have given their lives and 1,615 have been invalided home. Monies to the amount of $1,300,000 were collected during the two campaigns for the British Red Cross, and at least $1,500,000 has been subscribed in Toronto for the Canadian Red Cross although the exact figures are not available. A list of the fatalities that occurred in that city during the year 1916 is also given. These were to the number of 198, including—found dead, 50; died suddenly from heart failure, 43; killed by motor cars, 23; suicides, 15; drowned, 15; killed by street cars, 14; accidentally killed, 12; died from gas poisoning, 12; killed by trains, 8.

Editorial

THE SPECIAL BOARD OF INQUIRY

LAST summer Sir Sam Hughes, the late Minister of Militia and Defence, appointed Dr. Herbert A. Bruce, of Toronto, Special Inspector General to report upon the medical work of the Canadian Expeditionary Force overseas. Dr. Bruce, it is needless to say, is a distinguished surgeon, but he had no previous experience of Army Medical matters, save that in May, 1915, without any preliminary Army Medical training he had been created Lieutenant-Colonel C.A.M.C., had spent a few days attached to the Duchess of Connaught's Red Cross Hospital at Taplow, and a few weeks attached to a Canadian General Hospital at the base in France. In all, his total stay overseas scarce exceeded two months. Now, without active service between times, he was appointed full Colonel with extensive powers, one of which was to nominate a "Board of Inquiry" to investigate and report upon the administration of the Canadian Army Medical Corps, both in England and overseas from England. That Board consisted of Colonel Bruce as chairman; Colonel F. A. Reid (of Hamilton, Ont.), Director of Recruiting and Organization; Colonel Wallace Scott (of Toronto, nephew of the Minister), Officer Commanding Moore Barracks Hospital, Shorncliffe; Lieut.-Colonel F. W. E. Wilson (of Niagara), A.D.M.S., Canadian Training Division, Shorncliffe; Lieut.-Colonel Walter McKeown (a Toronto surgeon), President of the Standing Medical Board, Shorncliffe Area, and Captain Charles Hunter, C.A.M.C. (of Winnipeg), a member of the same Standing Medical Board as Secretary. This Board was irregular, both in its constitution and procedure. Authorized by the General Officer Commanding Canadians, Shorncliffe Area, it, strictly, had jurisdiction only within that area, nor indeed had any of its members experience overseas from Great Britain, or indeed outside the Shorncliffe Area, save for the few weeks spent by its President at Le Tréport, and in unofficial wanderings elsewhere during the previous summer; it held no stated meetings; it would seem that no witnesses were cited to appear before it as a body, nor again, were any of those who might be implicated by its findings given the opportunity, in accordance with Army Regulations, to appear at its sittings. After some two months' work it produced a printed, confidential report of 23 sections and some 100 quarto pages, signed by the President of the Board alone, although he stated in his introduction that the members of the Board unanimously agreed to the findings.

It is well known that this confidential report was "one of the frankest indictments of a Government service ever received by a responsible minister". Not a branch of the medical administration but received severe criticism: expressions such as "almost criminal" were not wanting: there was throughout the body of the work not a single word of commendation: lack of attention to the needs of Canadian invalid soldiers was freely charged; contrary to medical ethics a distinguished colleague of the President was named as guilty of careless or neglectful surgery, without being given opportunity to present his side of the case; a reorganization of the Canadian Medical Service from top to bottom was declared necessary and the responsibility for the state of affairs presented was placed upon the shoulders of the Director of Medical Services, Surgeon-General Carleton Jones.

We mention these matters freely because whole chapters of this "confidential" report were permitted by the late Minister to appear in the Canadian daily press day after day without any attempt to prevent their appearance. We cannot believe that it was not in his power under war conditions to prohibit publication.

To this work of weeks on the part of the Committee the

D.M.S. was given three days, subsequently extended to four, in which to formulate a reply. That could, on the face of it, be but preliminary and incomplete; to investigate individual cases cited would demand weeks. The ordinary man would think that in common fairness to the Army Medical Service, containing, as it does, not a few of the leaders of Canadian medicine, and to the distinguished officer at its head, once the accusation had been given publicity, the Minister would have given equal publicity to General Carleton Jones' answer to these serious charges. Not even an epitome of the same has, however, been published, nor can we learn that the reply has been printed. We presume that it has been placed before the Cabinet, but cannot hear of anyone who has seen it—and yet it surely exists.

Undoubtedly the storm of indignation caused by this train of events played an important part in the dismissal of the late Minister from his post.

But so careful are the Imperial authorities not to interfere in Canadian matters that it is doubtful if any action would have been taken had not Colonel Bruce seen fit in his wisdom to recommend a complete disorganization of the British Army Medical System in France, and when recommending a similar disorganization in England, had seen fit to make a direct attack upon the British Voluntary Aid Hospitals and the British Army Medical system generally. Such attacks, supported as they were by the late Minister in his speech at the Empire Club in Toronto, could not be passed by in silence.

When Sir George Perley, appreciating the wholly irregular nature of the previous Board, recognized the difficulty of securing an adequate and properly constituted Board of Inquiry from the Canadian Military Service (General Jones being the senior member of the C.A.M.C. and, as such, having no medical peer who could duly sit in judgement upon him), he applied to the Imperial authorities for assistance, and they for once were willing to take part, the questions raised being more than purely Canadian. By them General Sir William

Babtie, V.C., a foremost member of the Royal Army Medical Corps, was nominated President of a Special Board of Inquiry. Sir William Babtie had gained his V.C. in the South African War, had been head of the Medical administration in Egypt and at the Western seat of war, and now is Deputy Director-General under Sir Alfred Keogh at the War Office. No better qualified and more competent officer could have been appointed. Under him were nominated Colonel E. E. Ashton, General Officer Commanding the Canadian Training Division at Shorncliffe; Colonel J. T. Fotheringham (a prominent Toronto physician), A.D.M.S. 2nd Canadian Division in France; Colonel A. E. Ross, a well-known member of the Provincial Parliament in Ontario, A.D.M.S. of the 1st Canadian Division at the Front, and Colonel J. M. Elder, a Professor of Surgery McGill University, and head of the Surgical Section of No. 3 Canadian General Hospital at Boulogne.

The report of this Board, of which an epitome is given in this issue, is a striking reversal of Colonel Bruce's findings. It is in emphatic disagreement from every one of his main recommendations. As indeed might be expected, Colonel Bruce is convicted of lack of intimate knowledge of army organization, and is charged with ignoring the good work done by Surgeon General Jones and his staff under circumstances of novelty and great difficulty. That work, instead, comes in for high appreciation and the General is specially commended for his zeal, industry and tact. Colonel Bruce's concentration scheme receives whole-hearted condemnation. It is shown that this would involve a capital expenditure of a million dollars for hospital accommodation in England alone. The Board adds: "After conversation with many Canadian "soldiers in different hospitals and with officers and others "familiar with the present system, the Board has failed to "discover any general sentiment among Canadian troops in "favour of their exclusive treatment in Canadian rather than "British hospitals."

As the *Times* remarks: "The following passage is remarkable in a formal official document: 'It appears to the Board that to separate, on their return to England, men who have fought side by side, must tend to undo the bond of brotherhood sealed in the face of the enemy. The Board is aware that these considerations of high policy do not strictly come within its purview, but cannot refrain from adverting to this aspect of the matter, because it would almost appear as if the report under consideration was based upon the conception that the Canadian Forces had a similar relation to the British Armies as that held by the Allied nations.'

"And again: 'The Board is of the opinion that so long as the Canadian Expeditionary Force forms an integral part of the Imperial Army such a view is no more possible in the United Kingdom than it is in France, and so long as the Canadian troops continue to operate under the command of the Commander-in-Chief, British Expeditionary Force, it must continue to be impossible to discriminate in the medical arrangements of Canadian and British troops.'"

As regards the V.A.D. hospitals the Board finds that in them the patient is well fed, comfortable and happy and receives an amount of care that is only possible in institutions organized on the lines of the home, and points out that this has been an enormous asset in the case of soldiers widely separated from their kith and kin. The economy to the Canadian Government of the V.A.D Hospital system is pointed out, the nursing such that the Imperial authorities have not hesitated to send V.A.D. nurses to France and the Mediterranean, and no ground is found for Colonel Bruce's grave indictment that "a good deal of the surgery is bad." It is pointed out that not a little of the delay of patients in these hospitals has been due to the imperfect working of the Canadian Casualty Clearing Station (originated and controlled, it should be pointed out, by Colonel F. A. Reid, one of the members of Colonel Bruce's Board.)

In agreement with Colonel Bruce the Board finds that large numbers of Canadian soldiers have reached England who are unfit for service at the Front (this, however, is a fault which can scarce be laid upon the D.M.S., Canadians, in England), and that additional inspection of Canadian hospitals and of Canadian patients in British hospitals is desirable; that additional consultants should be appointed and that there should be a greater return of invalid soldiers to Canada (increased developments, that is, of movements already initiated by Surgeon General Jones.)

"There is a sequel to the Report." Sir George Perley has cancelled Colonel Bruce's appointment as Special Inspector General. General Carleton Jones has been reinstated as D.M.S., Canadian Medical Services in England, and latest reports announce that he is to be appointed Inspector General of the Canadian Medical Service in Canada, England, and France, to supervise and coördinate, that is, the service in all its extent.

AN APPEAL TO THE PROFESSION

MEMBERS of the medical profession, civil and military, in Canada occupy a position of great responsibility since it is through them that the physical condition of Canadian soldiers is established; consequently, physicians and surgeons are constantly called upon to express their professional opinion concerning the physical condition of men, not only to decide their fitness for service, but also in connexion with the awarding of pensions.

The responsibilities of the medical profession, in this connexion, are then of great public importance. Unfortunately it is evident that not all medical practitioners have fully realized the gravity of these responsibilities, added to their professional position by the war. There are instances in which medical men have made ill-considered statements in connexion with applications for pensions and a paragraph which appeared in this JOURNAL for November (page 1021) tells its own story. In that paragraph, editorial comment was made upon a physician who had given a certificate falsely stating that a soldier was suffering from tonsilitis in order that his leave might be prolonged; the assertion was made that similar instances of unjustified certification were known and that the matter had been placed in the hands of the College of Physicians and Surgeons for the Province of Ontario.

There is no doubt that physicians who have granted false certificates to soldiers have not given full consideration to the seriousness of their action. There is little doubt that, as a rule, they either have been led away by a natural desire to assist a soldier in his attempt to obtain leave or pension, or that they have merely been careless and too willing to accept, without thorough investigation or examination, statements made to them.

Medical men must realize the responsibilities added to their positions by the war. They must realize the effect which a false certificate may have in misleading those expending public monies. No matter what the intention in issuing it may have been, the consequence of giving a false certificate concerning a soldier's physical condition is always the same. If the certificate is acted upon, the Government is defrauded.

If a physician issues a false certificate in good faith and without actual intention to assist in a fraud, he renders himself liable to the criticism of his colleagues. If a false certificate is given wilfully, a physician is not only liable to the condemnation of his fellows; but also to prosecution in the criminal court.

Public duty, professional integrity and personal interest, all unite in making it to the utmost desirable that a physician should always exercise the greatest care in signing statements concerning the physical condition of persons who require a certificate as to their physical condition for purposes connected with the naval or military services or with the granting of pensions.

The wish to do everything possible to assist soldiers, or their dependents, in obtaining their due, doubtless explains the inaccuracies in those cases in which false medical certificates may have been signed; nevertheless, the results of such false certificates are the same as though wilful misrepresentation had been made—public money is misappropriated.

THE CARE OF THE SOLDIER'S TEETH

AMONG the ills that afflict the Army at the front, toothache, tender teeth, and sore gums occupy a conspicuous place, if not in text-books and articles in the medical journals, certainly in the trenches and in the thoughts of the soldier. As befits those coming from North America, the Dental Service with the Hospital and other medical units of the Canadian Expeditionary Force was from the beginning of the war distinctly in advance of what obtained with the British medical units, so much so that, wherever they were situated, the dentists attached to Canadian units found themselves worked to their utmost, conducting what may be termed an out-patient department for men from neighbouring British units, proving that at the seat of war the dentist is a most valuable and well occupied officer. But he is of service only when the teeth are in advanced disorder; from the nature of his work, unlike the medical officer, he does not come into constant contact with every man in a battalion: he cannot keep a continued supervision over the health and well-being of the unit to which he is attached, so that he can instil no general personal instruction upon the care of the mouth: he does not, like the medical officer, accompany the battalion into the trenches and is not at hand to deal immediately with teeth troubles. Whether, that is, the army dentist belongs to a separate corps or no, men have first to consult the regimental medical officer and by him be directed to obtain special treatment.

One well-known Canadian medical officer, who has won a well deserved V.C., realizing the situation and the frequent and urgent need for treatment of the teeth in the trenches if an undue proportion of the units were not to be incapacitated through toothache and sent to the rear, taught himself the simple technique of sterilizing cavities and of packing with a temporary filling, and has found this so helpful to his men that he is convinced that every regimental medical officer in the course of his special training should be instructed in what may be termed Dental First Aid.

There is, however, another widespread condition not needing instrumental care which is painfully prevalent at the front and comes to the notice of the regimental medical officer. This is often referred to as pyorrhœa alveolaris, but pyorrhœa alveolaris it is not, although it may be grafted upon it. It is a specific form of ulcero-membranous stomatitis, spreading over the gums and even the cheeks, which become covered by a dirty whitish and brittle false membrane tending to break down into shallow ulcers. The tonsils may be affected and there the ulcers are apt to be deep. As it progresses the teeth become tender and loose and mastication of bully beef and hard tack becomes impossible. There is one characteristic general symptom, namely, intense depression. As a consequence, leaving aside the inadequate nutrition, the affected men become spiritless and useless as combatants. The condition is definitely infectious: certain units may wholly escape, others may be extensively affected—nor are well marked histories wanting of the spread from man to man.

The first full study of the condition during the war was made by Captain F. B. Bowman, C.A.M.C., pathologist to the Moore Barracks Hospital and now officer in charge of the Divisional Pathological Laboratory at Folkestone. While in some cases he found the pyorrhœal condition and detected amœbæ, in others these were absent. The dominant feature in all was the abundance of Vincent's fusiform bacilli with the associated spirochætes. He thus was led to suggest treatment with a mouth-wash of practically equal parts vinum ipecac.

and Fowler's solution with a little glycerine. The effect of this is very striking. Sixteen drops of the solution placed on the tooth brush night and morning, the teeth and gums gently brushed, and the mouth then washed out with clean water, lead to the rapid disappearance of the membrane, healing of the ulcers, and to comfort and painless mastication in the course of a few days. As with emetin in pyorrhoea, this does not always and of necessity bring about a complete cure. There may be relapses, but by repetition of the treatment the condition is kept well under control. Captain Bowman's full paper was published in the *Proceedings of the Royal Society of Medicine* at the beginning of last year.

Recognizing the need for the care of the teeth, all men of the British Expeditionary Force are supplied with a tooth brush and are instructed to use this regularly. We doubt whether herein the authorities have fully grasped the psychology of the soldier, or indeed of the ordinary mortal. We are reminded of an episode of our own early youth when we were duly provided with and instructed to use a tooth brush, but with it were given no tooth powder or paste. As a result, brushing the teeth was more honoured in the breach than in the observance. Then came a lucky bazaar with its lucky bag and a neat box of Japanese tooth powder as the prize. Possessed of that we from that day brushed our teeth regularly. Without a box of like nature, we learn that the ordinary Tommy at the front uses his tooth brush for anything but cleaning the teeth, more particularly for polishing and, as regards the handle, to take the place of a spoon. What we urge is, give the Tommy a decent preparation and he will care for his teeth regularly. This must obviously not be fluid; nor must it be a powder, for that is liable to break loose in his knapsack; nor yet a paste, for most of us have experienced that these attractive collapsible tubes last but a brief month or so. A firm soap in a neat tin is indicated, for this is both compact and safely carried and with proper use will last ten weeks or more. Such a soap has been elaborated by Major Wells of the Canadian Dental Corps and, we understand, has been distributed for some months to the Canadian Expeditionary Force in Canada. We have tested it practically and have encountered no more efficient and pleasant preparation. This, or some similar mildly antiseptic soap, should be supplied to all the troops in the British Expeditionary Forces. In the words of a far-flung advertisement we can imagine the Tommies "crying for it".

PARATYPHOID

WHEN, as late as 1898, Gwyn isolated from a febrile case in Johns Hopkins Hospital an organism differing from the typhoid bacillus, if it had been prophesied that paratyphoid, the disease due to his new found germ, would be more prevalent than typhoid in the world's greatest war, it would not have seemed credible; but that is the present state of the matter.

Whereas perhaps three cases of paratyphoid might then have been found to one hundred of typhoid, the figures in France may now be almost reversed, and no greater proof can be given of the efficacy of antityphoid vaccination. Indeed Widal makes the statement that when French soldiers were on occasion exposed to particularly unhygienic surroundings it was paratyphoid and not typhoid which they developed.

Another alteration in our point of view has come about when the mortality statistics of paratyphoid are exposed—a disease which in peace time and in this country is regarded as practically without mortality, and usually without even serious symptoms, shows a mortality of over 1 per cent. in France and 4 per cent. in the Dardanelles; and also furnishes hæmorrhage, perforation and delirium as some of its manifestations. Another point frequently brought out is that a large number of cases are ambulatory and resemble mild influenza rather than the enteric fevers, and may readily pass unrecognized without bacteriological examination.

It has been shown that the greatest number of positive blood cultures is found on the fifth day of the disease and Willcox has pointed out that an early clinical diagnosis is thus of the greatest value in bringing the case before the bacteriologist and he very pertinently remarks that it is of much greater importance to distinguish paratyphoid from influenza or rheumatism than it is to differentiate it from typhoid since in the latter instance the same measures of isolation and treatment will be taken. Certain clinical features which assist in the differentiation from influenza are: the more gradual onset of symptoms and ascent of fever, the absence of coryza, the rarity of rigors, the mild character of the prostration compared with the degree of fever, the occurrence of diarrhœa, and the absence of cardiac disturbances during the febrile stage.

From typhoid, the generally milder character, the rarity of nervous symptoms, the earlier remissions of fever and the greater tendency to early diarrhœa; as well as the larger, more raised and more dusky spots which occur in a considerable proportion of the cases, give a clue but cannot replace laboratory methods in the diagnosis.

Naturally the relative prevalence of paratyphoid has brought into prominence the mixed vaccine for protection against paratyphoid A. and B. as well as typhoid, and while Leishman is quoted as of the opinion that the efficacy of the typhoid protection is lowered by the mixture, Widal strongly supports the combined inoculation.

Last year the city of Toronto applied to the provincial government for power to transfer the medical inspection of schools from the Department of Education to the Board of Health. The matter was left undecided in the hope that some agreement might be come to between the two departments. As this, however, could not be arranged, the question was put to the public vote on January 1st, when the citizens expressed their wishes in no uncertain terms, a tremendous majority voting in favour of the suggested change. The matter will be taken up again at the next session of the provincial legislature.

An interesting case was recently argued in the Chancery Division at St. John, New Brunswick, before His Honour Mr. Justice Grimmer, when a suit was brought against the Moncton Hospital Board by Mr. Francis P. Murphy of Moncton. A by-law was passed by the hospital board last year, by which any person by payment of a sum not less than one dollar was entitled to vote at the annual meeting upon any question, including the election of trustees of the hospital. Accordingly a number of persons paid the necessary subscription and subsequently registered their vote at the annual meeting, when three trustees were elected, one of them being Mr. Murphy. An adjourned meeting of the hospital board was held, at which the by-law previously passed was declared to be *ultra vires*. A second vote was then taken with the result that Mr. Hamilton, one of the retiring trustees, was reëlected instead of Mr. Murphy. In bringing his suit, Mr. Murphy claimed that the action taken by the hospital board at the adjourned meeting was illegal, and demanded damages. The contention of the defendants that both the by-law and the proceedings at the annual meeting were illegal was upheld by the Judge, who pronounced judgement in favour of the hospital.

The profits from the sale of Lord Northcliffe's book, "At the War," are to be given to the Joint War Committee of the British Red Cross and the Order of St. John of Jerusalem. The book contains a chapter on war doctors, in which Lord Northcliffe pays a fine tribute to the medical services, and although many readers of the Journal are doubtless familiar with the words, since they have been published in the *Times*, we may be pardoned for repeating them here. He says: "If there be degrees of chivalry, the highest award should be accorded to the medical profession, which at once forsook its lucrative practices in London, or Melbourne, or Montreal, in a great rally of self-sacrifice. The figures of the casualties among them bring home to those who have only the big hospital idea of the war doctor, sad facts that should lead to due understanding of this not sufficiently known but veritable body of Knights in the Great Crusade."

AN appeal has been made by Sir Reginald Wingate, Governor-General of the Soudan, for a fund to found a permanent memorial to the late Lord Kitchener. It has been decided that the memorial should take the form of a school of medicine at Khartoum, which will be affiliated to the Wellcome Tropical Research Laboratories and thus become a part of the Gordon Memorial College, which was established as a result of a personal appeal made by Lord Kitchener at the end of 1898. Subscriptions may be sent to Mr. Baldwin S. Harvey, Honorary Secretary, Gordon Memorial College, 67 Lombard Street, London, E.C., and all monies collected will be spent upon the building and equipment of the medical school which it is proposed to erect.

LAST July a number of women physicians were sent by the medical authorities to the British hospital base at Malta to take up duty as members of the Royal Army Medical Corps. Although women physicians had been attached to various hospitals as house surgeons and physicians and one notable hospital had been staffed entirely by women, this was the first time that they had been sent to a hospital base outside the British Isles. The departure, however, has proved eminently successful and the work of the woman doctors has been so satisfactory that in November a request was made by the military authorities for fifty qualified medical women to serve with the Royal Army Medical Corps.

THE CANADIAN ARMY MEDICAL SERVICE

REPORT OF THE BOARD OF INQUIRY*

THE report of the Board of Inquiry, appointed in November by Sir George Perley, High Commissioner for Canada, has been issued. It is signed by all the members, and is dated December 21st, 1916. It opens with some general observations as follows:

The Board having assembled in accordance with War Office letter No. 121–medical–2893, A.M.D.I., dated November 25th, 1916, proceeded to consider the report on the Canadian Army Medical Services by Colonel H. A. Bruce, the Special Inspector General appointed by Major-General Sir Sam Hughes, and a reply thereto by Surgeon-General G. Carleton Jones, then Director Medical Services, Canadian Expeditionary Force. Both officers have been examined by the Board, and in addition evidence from the officers and others enumerated in the appendix No. 1, was heard. A report of the evidence taken and copies of various documents submitted to the Board are annexed to this report. The Board, in preparing its report, has not only taken into account the evidence submitted to it, but has ventured to incorporate into some of its recommendations its own knowledge of conditions so far as they affect the efficiency of the Canadian Army Medical Service.

In making this report the Board has constantly kept in view not only the welfare of the sick and wounded of the Canadian Expeditionary Force, but the interests of the Government and people of Canada, and has been especially careful in its comments upon the work of the Director of Medical Services, whose administration has been so severely criticized, by the Inspector-General in his report and in his evidence.

It will be convenient to summarize here the principal points emerging from Colonel Bruce's report. These are:

(*a*) The concentration of Canadian sick and wounded in Canadian hospitals.

(*b*) The suitability of V.A.D. hospitals for the care and treatment of Canadian soldiers.

(*c*) The system of medical boards.

Before offering any general remarks on these topics, the Board thinks it right to explain that up to February, 1916, the accepted policy was to provide special hospital establishments for Canadian

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patients; that about that date, owing to various considerations, practical and sentimental, it was determined, with the consent of the War Office, to deal with Canadian patients in the same fashion as British patients are dealt with—that is, by distributing them throughout the United Kingdom to the great series of central hospitals, each with its group of affiliated auxiliaries.

In the report of the Special Inspector-General the latter system is condemned, and a return to the policy of Canadian hospitals for Canadian sick and wounded advocated. The issue is a fair one, for there is much to be said on both sides; but the Board, after very careful consideration, has come to the conclusion that the policy therein recommended is not only unwise but impracticable, having regard to the amount of accommodation that would be required owing to the increase of Canadian troops in Europe.

The arguments for and against are set forth under the headings into which this report is divided, but it will be convenient to consider here the principal reasons that have led the Board to the opinion that a reversion to the original scheme of concentrating Canadian sick and wounded in Canadian hospitals is impossible.

All through the report of the Inspector-General the dominating idea is a conception that the Canadian Expeditionary Force is something separate and apart from the Imperial army, a conception that may be summarized as the "water-tight compartment" policy in matters medical. The Board is of opinion that as long as the Canadian Expeditionary Force forms an integral part of the Imperial army, such a view is no more possible in the United Kingdom than it is in France; and, so long as Canadian troops continue to operate under the command of the Commander-in-Chief, British Expeditionary Force, it must continue to be impossible to discriminate in the medical arrangements of Canadian and British troops. The personal experience of the majority of the members of the Board amply confirms this view, so far as the arrangements at the French front and at the Overseas bases are concerned, and the Board has satisfied itself that it would be inadvisable to attempt separation on the return of the sick and wounded to the United Kingdom.

It appears to the Board that to separate, on their return to England, men who have fought side by side, must tend to undo the bond of brotherhood sealed in the face of the enemy. The Board is aware that these considerations of high policy do not strictly come within its purview, but cannot refrain from adverting to this aspect of the matter, because it would almost appear as if the report under consideration was based upon the conception that the Canadian

Forces had a similar relation to the British armies as that held by the allied nations.

The policy that the Board ventures to attribute to Colonel Bruce would have prevented the use of Canadian medical units in the Mediterranean, because Canadian troops did not happen to be employed in that theatre of war, and the sending of Canadian hospitals to Paris for the use of the French sick and wounded. Indeed, the sending of Canadian medical units to the Mediterranean is criticized from this very point of view in the report of the Inspector General. Again, and for similar reasons, the Board is in profound disagreement with the view that Canadian Army Medical Corps personnel should not be associated with the British Service in scientific inquiries and in other work; on the contrary, it is of opinion that such participation is both desirable and necessary in the best interests of the two services. The Board, too, is at variance with the contention that the services of the Canadian Army Medical Corps should in the main be confined to Canadian troops; field ambulances serve primarily the Canadian formations, but in the case of the line of communication units, their work must of necessity be largely with other than Canadian troops. This aspect of the case, it is fair to say, was repudiated by the Inspector-General when placed before him.

The Board feels bound to place on record that in some of the opinions expressed by Colonel Bruce he is misled by a lack of intimate knowledge of army organization and of the inter-relation of the various branches of the service, as in some of his criticisms he has failed to make allowance for the sudden expansion of the army and for the unavoidable want of specialized training in its ancillary services. Such imperfections as have existed are rapidly being remedied, and it is plain truth to say that in no war in history has sickness been so well controlled or the sick and wounded so well cared for. The Board, relying on its own observations and the evidence laid before it, is abundantly satisfied that the Canadian sick and wounded have been thoroughly well cared for, not only in the Central Hospitals, whether British or Canadian, but in the Voluntary Aid Hospitals, which Colonel Bruce criticizes. These latter hospitals are the outcome of a mobilization of the medical resources of the United Kingdom, and in them Canadian soldiers are not only well cared for professionally but are comfortable, happy and at home. The Board desires to emphasize its dissent from the criticisms of these institutions, which it believes to be unjust and undeserved.

The other principal issue raised in the report of the Inspector-General, the system of Medical Boards, is dealt with in detail hereafter, and the Board agrees that there is much justice in the criticisms levelled at the complicated arrangements that have been permitted to grow up. With the reorganization proposed the Board is unable to concur, and has ventured, as the result of the combined experience of its members, to suggest a system that it believes to be simple and likely to be practical in operation.

The Board does not concur in Colonel Bruce's view that a complete reorganization from "top to bottom" of the Canadian Army Medical Service is necessary. In its opinion, the reforms he suggests would not remedy the defects he deplores, which are not due to the system, but to inexperience on the part of officers, military and medical, and to defaults in administration which are commented upon in the detailed criticisms that the Board has felt it its duty to record.

The Board cannot conclude this general review of its findings without adding that the report of the Inspector-General ignores the good work done by Surgeon-General Jones and his staff under circumstances of novelty and great difficulty. The Board has not hesitated to criticize those matters wherein, in its opinion, the Director of Medical Services has failed, but does so with great reluctance, for it is satisfied that much of what has been accomplished has been the result of his zeal and industry, while the good relations of the Imperial and Canadian services are largely due to the tactful performance of the many delicate duties that fell to his lot.

The Board would also point out that the lack of an organized Canadian staff was a very serious handicap to the Director of Medical Services in his dealings with the important subject of non-effective troops.

The remainder of the report deals with Colonel Bruce's criticisms paragraph by paragraph. It will be seen that certain sections are of general interest, and have a direct bearing on several matters of concern to the profession in the United Kingdom.

I.—Soldiers arriving in England from Canada Medically Unfit.

The Board is agreed that large numbers of soldiers have come and continue to come from Canada who are unfit for service at the front. The cases come under two main headings:

1. Men who do not comply with recruiting standards as to age.

Of one series of cases, numbering 1,366, submitted to the Board, 849 were either under or over age. As the recruiting medical officer is not required to consider the age of recruits, the charge as regards the C.A.M.C. is reduced to the second class—namely:

2. Men who are unfit by reason of a physical disability. The Board is satisfied that a large number of men have been passed who ought not to have been passed, owing partly to inexperience on the part of examining medical officers, partly to hurry, partly to carelessness, and partly to the opinion of the medical officer being overridden by commanding officers.

The Board advises that examining medical officers should be responsible, as in the British service, that a recruit's apparent age corresponds with his declared age; that there should be inspectors of recruiting familiar with the requirements of the army in the field; that no soldier should be sent overseas unless classified by a medical board as fit for general service.

The Board has come to the conclusion that this important matter has not received the attention it deserved, and that adequate representations with regard to it have not been made. The Board is not prepared to define the share of the responsibility of the D.M.S. for this failure, because the Adjutant-General's Branch of the staff, to which the subject pertains, was not represented in England until recently, but it considers that, in the absence of the Adjutant-General's Branch, it was the duty of the D.M.S. to represent by all sources open to him the fact that large numbers of men were reaching England unfit for general service.

II and III.—Distribution of Casualties and Concentration of Hospitals

Under this head the Board points out that Colonel Bruce's objections to the present system of treating a moiety of Canadian patients in Imperial hospitals distributed throughout the United Kingdom, and his advocacy of the policy of concentrating them in purely Canadian hospitals, are interdependent.

As regards distribution, the Board recognized that the Canadian soldier returning from England to France is not in the same position as the British soldier so returning, but, despite this important difference, the Board is of opinion that, practically speaking, a system of distribution which is satisfactory in the case of the British soldier, need not be inefficient in the case of the Canadian.

The Board considers that what is required to meet the special circumstances of the Canadian soldier is an extension of the system of Canadian convalescent hospitals, and organized coöperation as regards inspection between the Canadian and Imperial services. The Board is satisfied that considerable difficulties must arise in the collection and distribution of Canadian invalids to Canadian hospitals, because the problem begins at the front, and, from the personal experience of the majority of the members of the Board, it believes that it is quite impracticable to earmark and collect Canadian casualties at the base in France, and that it would be difficult and inconvenient to direct them solely to Canadian hospitals in England. Special arrangements for their despatch would be necessary, and while the Board had it in evidence from the principal embarkation medical officer that the difficulties are not insuperable, they are sufficient to enhance the complexities of an already complex problem. The administrative difficulties in this respect would, the Board believes, be found in practice serious, and would almost necessarily involve the provision of clearing hospitals at or near the ports in England. Even if the difficulties of collection in France could be got over, it would necessitate the holding of Canadian patients in France until a sufficient accumulation occurred to justify special arrangements for distribution on arrival in England. This policy the exigencies of war would be bound to frustrate. If, however, this proved to be possible, the difficulties of distribution to Canadian hospitals in England would disappear.

But the Board is of opinion that the present system must hold the field if it is found impracticable to find suitable hospital accommodation for the whole of the Canadian sick and wounded in the Shorncliffe area and its neighbourhood, to which it is important that any such scheme should be confined. The establishment of Canadian hospitals in England, even if all were situated south of the Thames, would not meet the requirements, but might even accentuate the difficulty of distribution, and, in either case, the Board is satisfied that the policy of centralization would be unwise and expensive, and is impracticable. It considers that it is unwise on broad grounds of policy, believing that it is to the best interests of both British and Canadian soldiers that they should meet one another, and, as illustrative of Canadian sentiment in this matter, remarks that the Canadian hospitals at Beachborough, Taplow and Orpington are governed by explicit provisos on the part of the donors that they are not to be confined to the treatment of Canadian sick and wounded.

That such a policy would be expensive is certain, for it would probably be necessary to erect hut hospitals, at large cost and with much delay. The Board is of the opinion that such expenditure would not be justified without very grave and urgent necessity. It does not believe that any such necessity exists, for, after conversation with many Canadian soldiers in different hospitals and with officers and others familiar with the working of the present system, it has failed to discover any general sentiment among Canadian troops in favour of their exclusive treatment in Canadian, rather than in British hospitals. The present system permits the individual Canadian soldier to select, subject to administrative convenience, the neighbourhood to which he would desire to be sent, and, while there is evidence that Canadian soldiers from time to time ask to be sent to a particular locality or transferred from one hospital to another, the reason generally given is to be near relatives in the United Kingdom, and is not generally associated with their treatment and comfort in Imperial hospitals.

The Board does not suggest that the existing Canadian hospitals in England should be given up, and does not object to a reasonable extension of these hospitals, but, even without extension, there is no reason why any wish on the part of a Canadian soldier to be treated in a Canadian hospital should not be met, just as the desire to go to a particular neighbourhood in Great Britain is gratified whenever circumstances permit.

Even if sufficient separate accommodation could be provided for all Canadian casualties in one area in England, it would either be necessary to retain a large number of empty beds to meet the eventualities of war, or, if these were utilized for British patients, as Colonel Bruce suggests, then they might not be available for Canadian patients when the Canadian Corps was heavily engaged. In the opinion of the Board, such a policy must of necessity break down under the stress of war. The special advantages that Colonel Bruce claims for a policy of concentration can be attained with existing arrangements, which are sufficiently extensive to permit of the utilization of the special skill of Canadian physicians and surgeons in all branches of medicine and surgery.

The question of cost cannot be considered apart from that of the existing arrangements, whereby Canadian soldiers are subsisted in Imperial hospitals, whether military or V.A.D., at a cost of three shillings a head a day, whereas the average cost to the public of Canadian soldiers in Canadian hospitals, as of British patients in British hospitals, is from six to seven shillings a head a day. The difference is due to cost of personnel and equipment. The Board thinks it right to state that similarly British patients are maintained in Canadian hospitals at the same charge of three shillings, but obviously the balance of advantage is in favour of the Canadian Government, and if Colonel Bruce's policy were adopted the many advantages of this reciprocal agreement would be very much diminished.

Although it has considered these questions on a money basis, the Board believes that, if it could be established that the Canadian soldier suffered from being treated in Imperial hospitals, the Canadian Government would not consider the cost in any way, but there is ample evidence that Canadian soldiers have not suffered from being treated in Imperial hospitals.

This important subject has been dealt with at some length, because the chief consideration in the reorganization suggested by Colonel Bruce is a policy of preferential treatment, which the Board considers impracticable in its application, and which it believes to be unwise and opposed to Canadian sentiment.

IV.—Unnecessary Detention in Hospitals, etc.

The Board does not agree that three is a lack of efficient medical inspection in hospitals, but agrees with Colonel Bruce and Surgeon-General Jones that additional inspection of Canadian hospitals and of Canadian patients in British hospitals throughout the United Kingdom, is desirable from the Canadian standpoint. There is evidence that the desirability of special inspections of Canadian patients in British hospitals was not fully recognized by the then D.M.S. until July of this year, but the Board is of opinion that this policy, with which the Board is in complete sympathy, should have been initiated at an earlier period. From early in the war the Canadian Red Cross had organized a system of visits to Canadian patients in British hospitals throughout the United Kingdom, and the valuable information collected in this fashion was available to the D.M.S. and frequently utilized by him.

The Board agrees with Colonel Bruce and Surgeon-General Jones as to the desirability of additional consultants being appointed, and thinks that there is ample scope for a consulting surgeon, as well as a consulting physician, in Canadian hospitals in the United Kingdom, although it recognized that Canadian hospitals have had the advantage of the advice of experienced consultants. The Board suggests that it would be better if Canadian consultants were appointed to the Imperial Army, instead of their services being confined to Canadian hospitals, and if this policy were adopted it might apply not only to the United Kingdom but to

France. The Board thinks it right to refer to the allegation that there have been many errors of diagnosis and treatment. The Board is decidedly of the opinion that there is no cause for alarm on this score, as such errors as have come to notice are incidental to the exigencies of active service, and believes that they do not prevail to as great an extent as in the ordinary course of practice in civil hospitals whether in Europe or Canada.

In opposition to the views of both Surgeon-General Jones and Colonel Bruce, the Board is of opinion that it would be preferable that the head of the medical service should remain in Ottawa as the principal medical adviser of the Government upon all questions, such as the medical examination of recruits, the organization of new units, selection of medical officers for commissions, and other questions upon which the Government in Canada might desire the advice of a senior and responsible officer, matters which, in the opinion of this Board, are intimately bound up with the success of the forces in the field.

The Board is agreed that there is a considerable accumulation of convalescent Canadian patients in Imperial hospitals, and that this is due to the insufficiency of accommodation at present in Canadian convalescent hospitals. The Board is also satisfied that there are in the United Kingdom a large number of Canadian invalids who ought to be sent back to Canada, but whom it has been impossible to repatriate because the available accommodation in Canada has been insufficient. The Board attaches the greatest importance to the early provision of sufficient accommodation for returning invalids in Canada, and directs attention to the fact that all invalids returning to Canada have so far been conveyed in returning transports or passenger steamers. In view, however, of the increased number of Canadian troops in Europe and the growing number of serious cases, who it is generally agreed should be sent to Canada at an earlier stage, the Board suggests that the provision of a regular hospital ship should be considered.

V.—Use of V.A.D. Hospitals

The Board of Inquiry does not concur in Colonel Bruce's recommendation that the use of V.A.D. hospitals by the C.A.M.C. should be discontinued, and makes the following remarks on the system:

1. *Inefficiency:* It does not agree that, as a class, the V.A.D. hospitals are inefficient, and the evidence which, to Colonel Bruce, indicated inefficiency, was really due to defective classification, whereby some V.A.D. hospitals, which were not equipped for all

purposes, occasionally contained patients for whom treatment should have been prescribed in a hospital of a higher scale. Even in such cases, facilities for the transfer of such incidental admissions to primary hospitals were always available, and in no case did the Board find that faulty treatment could fairly be attributed to the V.A.D. system.

2. *Expense:* The charge for a patient in a V.A.D. hospital never exceeds three shillings a day, and the Board has it in evidence and is satisfied that the cost per patient in a military hospital is at least six shillings per day.

3. *Unsatisfactory:* Colonel Bruce's point of view would appear to be that those hospitals which are the inevitable outcome of a general mobilization of the medical resources of Great Britain are unsatisfactory from an administrative and professional point of view, but the Board is satisfied that in no other way could the situation arising out of the war have been met, nor could it be altered now without vast and unjustifiable expenditure. The Board in its report passes in review the following points mentioned by Colonel Bruce as evidence of the unsatisfactory nature of these institutions:

(*a*) *Inconvenient Location,* the Board considers, was in many instances inevitable, as accommodation had to be made use of wherever available. The inconvenience is largely minimized by the system of classification of patients, by ample facilities for transportation, and by periodic inspections by Imperial and administrative officers.

(*b*) *Medical Staff:* The medical staff is generally found from the local practitioners, who nearly all give their services gratuitously and make large sacrifices in so doing. The investigations of the Board do not support these allegations of inefficiency. The standard of professional efficiency naturally varies, but there is no ground, even in the special reports made by Colonel Bruce's direction for the grave indictment contained in his report, "a good deal of the surgery is bad;" and if patients have been retained in these hospitals too long, it has been caused by the insufficiency of accommodation in Canadian convalescent hospitals and to delays in connexion with the C.A.M.C. in England.

(*c*) *Nursing Staff:* In all hospitals there is a nucleus of trained nurses (10 per cent.) whose work is supplemented by the devoted efforts of the Voluntary Aid Detachments, the members of which have undergone courses of instruction in first aid and home nursing, and who, after two years of hospital work, are many of them so efficient that the Imperial Government has not hesitated to send them to the great hospitals in France and in the Mediterranean. In no case has the Board had reason to be other than satisfied with the nursing in these institutions.

The Board states that the comments made in Colonel Bruce's report on the V.A.D. hospitals have been widely resented and expresses the opinion that these strictures are unjustified and regrettable. While it agrees with Colonel Bruce that patients could sometimes be more advantageously treated in, and more speedily evacuated from, large military hospitals, the advantages of the V.A.D. system should not be overlooked in this regard. In these hospitals the Board found the Canadian patient well fed, comfortable and happy, and receiving an amount of care only possible in institutions organized on the lines of "the home". This has been an enormous asset in the case of soldiers widely separated from their kith and kin.

VI.—Administration of Shorncliffe Group of V.A.D. Hospitals

The report explains the system under which V.A.D. hospitals are affiliated in groups to central military hospitals and the particular arrangements made at Shorncliffe. It expresses the opinion that the Canadian staffs employed in connexion therewith have been larger than were necessary. It does not agree that the employment of C.A.M.C. personnel should be confined to purely Canadian institutions or that the Canadian ambulance service should not be used for Imperial patients. In all these points the Board is opposed to the policy suggested by Colonel Bruce and in agreement with that carried out by General Jones.

VII.—Relations with the Red Cross

The report of the Board makes reference to the necessity for the continuance of the past harmony between the Red Cross Society, British and Canadian, and the medical service, and considers that the admitted irregularities at one place do not vitiate the policy, but adds that while rumours of irregularities were widespread, they apparently did not reach the ears of the D.M.S. The Board also adds that glaring departures from accepted service methods of administration passed unnoticed at Surgeon-General Jones's inspections.

VIII.—Detailing of C.A.M.C. Personnel for Imperial Service

The Board disagrees with Colonel Bruce, and expresses the strong opinion that the forces and resources of the army must be pooled in this struggle, and that interchange of personnel is desirable and necessary in the interests of both services. It is of opinion that the very instances quoted by Colonel Bruce prove the desirability of such interchange and believes that the policy adopted by Surgeon-General Jones will commend itself to the authorities.

IX.—Situation at Shorncliffe

With regard to the situation at Shorncliffe, where the A.D.M.S. Canadians was also A.D.M.S. Dover (British), the Board, both from its own observations and experience and from the evidence submitted, is opposed to the opinion expressed in Colonel Bruce's report. The Board is satisfied that the arrangement has been, and is, a good and satisfactory one as regards both the Canadian and British interests.

X.—Surgical Operations not Tending to Increased Military Efficiency

The Board agrees with Colonel Bruce that much surgery fitting in civil life is not advisable in military practice, and has evidence to the effect that efforts have been made to induce newly commissioned medical officers to regard physical unfitness from a military point of view, and that experience has effected a marked improvement in this respect. It appears that in the appendix to his report mention was made of twenty-one cases, and the Board states that one at least of these has come under its attention. The hospital records of that case were, the Board states, incorrectly reported by Colonel Bruce. The man had not suffered from the disability stated, the operation performed was not as stated, and the mention of the surgeon's name accentuated the grave injustice of the criticism.

XI and XII.—Special Hospitals

The Board is of opinion that a special hospital, such as that at Ramsgate, is essential. If treatment had to be delayed until the patient could be sent to Canada, even if sufficient accommodation existed there, the beneficial results of early treatment would not be attained. The Board, however, recognizes that many cases have been admitted and detained there whose immediate transfer to Canada was desirable, and this remark is applied in a special degree to cases of amputation. The Board, however, had evidence that the facilities existing in Canada are not as yet sufficient to meet the requirements in this respect. The Board, while recognizing that trades should not be taught in England, believes that there is a distinct therapeutic value in work for selected cases. The value of institutions in fitting men to return to duty was shown by the report of the officer commanding, which stated that 60 per cent. of the patients were discharged to full duty. Similar remarks are made with regard to Buxton Hospital, and the report states that Colonel Bruce admitted that his criticism had reference to its use for cases of chronic rheumatism. The Board is in agreement with his views in this respect. The consulting physician reported that seventy-one of all the cases treated at Buxton had returned to full duty. The Board states that it holds that this hospital serves a useful purpose.

XIII.—Venereal Situation

The Board finds that the efforts of the D.M.S. soon after his arrival in England, to secure adequate provision for these cases were not invariably supported by the higher authority, proper accommodation was not provided as asked, and, as a result, the discipline and control essential in this class of case were not secured. A solution of the difficulty can only be reached, the Board holds, by coöperation between the medical service and the Adjutant-General's Branch, and concurs in the view that the segregation of all such cases in an area by themselves, under special arrangements for treatment and discipline on the lines of a convalescent hospital, which combines treatment and training, is essential.

XIV.—Infectious Diseases

The Board states that the system of utilizing the isolation hospitals of local authorities is that generally adopted by the British service whenever possible, and considers that it was properly followed in this instance.

XV.—Medical Board Situation

The Board of Inquiry agrees that there is a necessity for reformation in the medical board situation and in the classification of casualties. It is of opinion that an easy solution of the problem would be the adoption of the British system so far as applicable, and makes suggestions in this direction.

XVI.—Records

The Board generally agrees with the criticisms made by Colonel Bruce, but points out that they are of universal application, and apply to all medical services in all wars. The desirability of improvement has not been lost sight of, and all available information is the subject of record by the Medical Research Committee. The Board does not agree that the defects in the system are attributable to the C.A.M.C., or that the proposals of Colonel Bruce are practicable. It is satisfied that Surgeon-General Jones has done a great deal towards the establishment of a better system than has hitherto been available in armies in the field.

XVII.—Pensions

The Board notes that Colonel Bruce withdrew certain remarks to which his attention was drawn, and expresses the opinion that the ultimate investigation of pensionable cases should take place in Canada.

XVIII.—Coördination

Many of the matters under this head are dealt with by the Board in its comments on the first section of Colonel Bruce's report. It is of opinion that the only course is the enforcement of stringent examination on enlistment, and adherence to whatever standard of fitness may be laid down in regulations from time to time. As to questions raised with regard to quarantinable diseases, such as trachoma, the Board agrees with Colonel Bruce that special action should have been taken to obtain sanction for the return of such cases to Canada.

XIX.—C.A.M.C. Personnel not used to Advantage

The Board disagrees with the contention underlying Colonel Bruce's report that the services of officers and other ranks C.A.M.C. should be confined to Canadian troops. It does not accept the statement that Canadian medical units are not serving, except in a small proportion of cases, Canadian sick and wounded in France. The statement is found to be incorrect as regards the thirteen field ambulances, and as regards the casualty clearing stations and stationary and general hospitals, the Board considers it obvious that their employment on the line of communication necessitates their being used for all troops using that line. The Board is therefore of opinion that Colonel Bruce did not appreciate the need of trained experts at the base and in casualty clearing stations, and holds that a specially trained practitioner who can efficiently command a field ambulance is, as a rule, of more value at the front than as a specialist in a general hospital.

XX.—Consulting Specialists

The Board is agreed as to the desirability of appointing civilian practitioners of eminence as consulting physicians and surgeons to Canadian hospitals in the United Kingdom, but holds that the appointment of consultants to the Expeditionary Force is a matter for the decision of the Imperial authorities. (See IV, above.)

XXI.—Discontent as to Promotion

The Board dryly remarks that this source of discontent exists in all armies. It found no evidence that it was abnormal in the C.A.M.C. It considers that the initial error lay in giving no lower rank than that of captain to officers joining the C.A.M.C. It recommends that the ordinary rules of promotion be observed and the senior officer selected for promotion, provided he has all the necessary qualifications, and that all future first commissions be in the rank of lieutenant.

XXII.—C.A.M.C. Training School

The Board agrees with Colonel Bruce's statement that the C.A.M.C. training school has never been properly organized; it has not yet been given an establishment, and only recently suitable accommodation. As it is in effect the dépôt of the Canadian Army Medical Corps overseas, the Board considers it of particular importance that it should be fully organized under an officer with practical experience in the field. It finds that efforts were made by the D.M.S. from time to time to get a suitable location and that no responsibility attaches to him, as he did not receive assistance or support from the authorities. It recommends that this important question should receive early consideration.

XXIII.—Economy in Management

The Board does not agree that in the operation of the medical service sufficient attention has not been paid to economy in management; on the contrary, the various arrangements that have come to its knowledge have been generally most advantageous to the Canadian Government.

Canadian Medical Association

THE MONTREAL MEETING

The Committee of Arrangements is now in a position to announce that Dr. F. J. Shepherd, of Montreal, has consented to deliver the Address in Surgery. This announcement we are sure will be welcomed by all the readers of the *Journal* and will, no doubt, go far towards ensuring a large attendance in the Surgical Section.

A provisional programme is in course of preparation and will be placed before our readers at an early date. It is the intention of the Committee to make a strong feature of the Military Section. The Chairman of that Section, Dr. A. Mackenzie Forbes, who has recently returned from the front, is in correspondence with many of our Canadian physicians now on active service, and he has already received promises of a number of interesting papers.

Miscellany

Book Reviews

Manual of Operative Surgery. By John Fairbairn Binnie, A.M., C.M., F.A.C.S., surgeon of the Christian Church, the German and the General hospitals, Kansas City. Seventh edition, revised and enlarged. 1363 pages with 1597 illustrations. Publishers: P. Blakiston's Son & Co., 1012 Walnut St., Philadelphia, Price, $7.50 net.

Professor Binnie's book is now so well known, and has been so frequently reviewed, that it hardly seems necessary to say anything of a particular nature about it, except to repeat the thoroughly justified words of commendation which have greeted the appearance of the successive editions. The author has succeeded in making his book, not only one for the beginner in surgery, but also one for the finished surgeon. He strikes admirably the happy mean between conciseness and diffuseness. The bibliography is full and satisfactory. The present edition brings the work thoroughly up-to-date and includes a very timely article on war surgery. In this particular chapter, written by Walter S. Sutton, and occupying some thirty pages, one gets a very good account, with excellent illustrations, of many of the newer splints, so many of which have been devised during the war. It is certain that one of the great advances in general surgery, contributed by the experience of the war, has been in the way of improvement in splints; and the American Ambulance in Paris, (in particular Dr. Blake) has contibuted a good deal in this direction. Naturally this chapter suffers in not including the progress of the last year in certain directions. Abdominal surgery, for instance, receives only two small paragraphs, whereas the progress made would justify a much larger space. One might reasonably quarrel with a few statements, such as that, in cases of gas gangrene "one should amputate at as low a point as possible," and that "one may with impunity pass through definitely infected tissue." To follow this advice would mean the sacrifice of many lives (according to the writer's experience) for the sake of saving a few inches of limb. Again, the author seems willing in such cases to allow a cuff, that is a flap; whereas the best judgement at present is strongly in favour of the flap-less, or "sausage" amputation. Nothing is said, moreover, concerning injuries of the head in war. However, it is obvious that general discussion of such subjects might go beyond the limits of a book on operative surgery.

In general one must say that Dr. Binnie's book is cordially to be recommended.

SYPHILIS AND THE NERVOUS SYSTEM : FOR PRACTITIONERS, NEUROLOGISTS AND SYPHILOLOGISTS. By DR. MAX NONNE, chief of the nervous department in the General Hospital, Hamburg. Authorized translation from the second revised and enlarged German edition by CHARLES R. BALL, B.A., M.D., chief of the nervous and mental department, St. Paul Free Dispensary. 450 pages with 98 illustrations. Second American edition, revised. Publishers: J. B. Lippincott Company, Philadelphia, London and Montreal, 1916.

THE physician and particularly the public, do not realize the gravity of syphilis and thus do not appreciate the importance of its involvement of the nervous system. We are not treating syphilis correctly to-day, but are satisfied if all symptoms of the primary lesion clear up and if a negative Wassermann test of the blood is obtained. Nonne in his excellent book—the latest and most complete work on syphilis and the nervous system—reviews the whole subject from the pathology of the various lesions, the different forms of the disease, to the many methods of treatment. His classification is very clear and the manner in which he enunciates the different points of each class is excellent. He shows how syphilis may assume the most diverse forms of symptomatology and how a patient, even though he has had the best treatment known for the primary lesion, may later develop signs pointing to involvement of the nervous system. Any physician, who has anything to do with syphilis, should read this book and if he does, he will see the importance of doing a lumbar puncture on every person who has contracted the disease and also of not depending too much on the Wassermann test of the blood.

Obituary

HARRY GOODSIR MACKID, M.D.

THE following sketch of the life of the late Dr. H. G. Mackid has been prepared by Drs. H. A. Gibson and R. B. Deane, of Calgary, at the request of the Calgary Medical Society and has been forwarded to the JOURNAL for publication. A notice of Dr. Mackid's death appeared in the September number and we are glad now to be able to give fuller particulars of the life of one who for many years was an active and devoted member of the Association.

The death occurred at Calgary, Alberta, on the morning of August 19th, 1916, in the fifty-eighth year of his age, of Harry Goodsir Mackid, M.B., M.D., Tor.; F.A.C.S., L.R.C.P., Edin.; L.F.P. & S., Glasgow; L.M., Edin. and Glasgow. Dr. Mackid's death came as a great shock to thousands of people throughout the West, for while his health had been rather indifferent for some years he remained in active practice until the last, in fact the coma which carried him off was only discovered when it became necessary to awaken him in the morning for an operation that he had to perform at 10 a.m. Dr. Mackid had suffered for about six years from diabetes mellitus but despite the inroads of the disease, a well-ordered life, careful treatment and a stout heart had enabled him to preserve a mental and bodily vigour sufficient to cope with the somewhat onerous duties attaching to the position of Chief Surgeon of the Alberta Division of the Canadian Pacific Railway Company which he had occupied for several years.

Harry Goodsir Mackid was born in Goderich, Ontario, on August 19th, 1858, and came of Scotch stock, his father being a native of Edinburgh, Scotland, and a Presbyterian clergyman. His early education was received in Goderich whence he proceeded to Toronto University, where he graduated in medicine in 1879, being a college friend of the late Dr. Ferguson. He supplemented his professional education with postgraduate work in Vienna, Berlin, London, Edinburgh and Glasgow, and from time to time in later life revisited these old world centres of professional learning, being always keen to keep himself abreast of medical thought and practice. Dr. Mackid began practice in Lucknow, Bruce County, Ontario, continuing there until 1884, when he moved to Seaforth, Ontario, where he stayed until 1889, in which year he came West to Calgary and remained here up to the time of his death. He was married in 1881 to Matilda Meyer, daughter of L.D. Meyer, Esq., Clerk of the Court at Seaforth. They are the parents of one son, Dr. L. S. Mackid, now a Major in the Canadian Army Medical Corps on active service in France.

Dr. Mackid was a Fellow of the American College of Surgeons, Past President of the Alberta Medical Association and of the Dominion Medical Association, a member of the consulting staffs of the Calgary General Hospital, Holy Cross Hospital, Calgary, and the General Hospital, Medicine Hat, and was Chief Surgeon of the Canadian Pacific Railway Company, Alberta Division. He served with the Queen's Own Rifles, Toronto, from 1876 to 1879, and was a town councillor in Lucknow in 1883, a member of the Calgary School Board from 1891 to 1892, and a member of Perfection Lodge A.F. & A.M. and Chapter R.A.M., Calgary. He was one of the most widely known men in the West, coming here in the early days when what are now the provinces of Alberta and Saskatchewan were called the North-West Territories, and he had perhaps the largest circle of friends of anyone in Alberta. Ever since coming West, owing to his official Canadian Pacific Railway position, he has been closely associated with railroad men and devoted most of his professional life to their service.

Dr. Mackid was an accurate observer, a clever diagnostician, and an expert operator. His leanings were distinctly surgical, and in the broad field of railroad surgery, where he had had for many years such unsurpassed facilities, his opinion was considered authoritative. Socially he was a delightful companion, full of bright sparkling wit, a good raconteur and a man who thoroughly enjoyed life's varied processes. In short he was a large hearted, broad minded man whose sudden demise has created a gap in the community in which he lived that will not soon be effaced.

SIR FREDERICK WILLIAM BORDEN

Sir Frederick William Borden died at Canning, Nova Scotia, on January 6th in the seventieth year of his age.

Although it is perhaps as the Minister of Militia and Defence, a position he occupied from 1906 to 1911, that Sir Frederick Borden is best known, he was educated for the medical profession and received the degree of M.D. from Harvard

University. He commenced to practise in 1868 and the following year was appointed assistant surgeon to the 68th Battalion of the King's County Regiment of Militia. He rose to the rank of surgeon lieutenant-colonel and honorary colonel in the Canadian Army Medical Corps, and in 1911 was appointed honorary surgeon-general in the Royal Army Medical Corps. He was elected a member of the House of Commons in 1874 as representative of King's County, Nova Scotia, the "Acadie" of Longfellow's *Evangeline*. Sir Frederick Borden held the honorary degrees of D.C.L. and LL.D. and was created K.C.M.G. in 1902. Upon the death of Lord Strathcona he was offered, but declined, the office of High Commissioner for Canada in England.

PROFESSOR JOHN A. HENDERSON

On the 2nd of January, after an illness of only two days, Dr. John A. Henderson, Assistant Professor of Anatomy in McGill University, died at his residence in Montreal. Dr. Henderson was born at Paris, Ontario, on October 28th, 1868. His medical course was taken partly at Toronto and partly at McGill, from which latter institution he graduated in 1893, obtaining honours in all subjects and taking the final prize.

After graduation he was intern in the Montreal General Hospital for a year, after which he took up the practice of his profession in Montreal. In 1895 he joined the staff of the department of anatomy of McGill. His steady advancement to the post which he occupied at the time of his death is an indication of the value set upon his services by his colleagues in his own Department and in the Faculty of Medicine.

By his students and his intimate friends he was familiarly known as "honest John," and this simple title abundantly describes the character of the man. Honorourable and upright to a degree, conscientious in the performance of his duty, he was a man of a type that can ill be spared by his college and by the community in which he lived.

Dr. John Edgar King died at Toronto on December 30th, 1916, after a long illness. He was born in Vaughan township in the province of Ontario and received his medical degree from Trinity College, Toronto. He was in practice for some years at Thistletown.

Dr. S. A. Ross, of Vancouver, died on July 10th, 1916. Dr. Ross graduated from McGill University in 1899. He had spent a year on active service and his death occurred a few months after his return to Canada.

Dr. Peter Livingstone, of Detroit, who died suddenly on December 24th, 1916, was born in Nairn, Ontario, in 1865. He was a graduate of the University of Michigan and had been in practice as a specialist in diseases of the eye, ear, nose and throat at Detroit since 1907.

Dr. C. L. Wheeler, who died at Brooklyn, New York, on December 30th, 1916, was born in Montreal on March 5th, 1864, the son of Dr. Thomas Brown Wheeler of Montreal, and a nephew of William Wheeler, a former Governor of the State of Rhode Island. Although Dr. Wheeler's professional career had been spent outside of Canada, he was well known to many Montrealers. He had been connected with the editorial staff of the *New York Medical Journal* since 1902, and had been editor of that journal since the death of Dr. Frank P. Foster in 1911. He was a man of great personal charm and many accomplishments, being gifted both in literature and music.

Claude Lamont Wheeler was educated in the public schools of Montreal and at the Universities of Laval and McGill. After receiving his B.A. Degree from the University of Laval, Quebec, he entered upon the study of medicine at McGill University, graduating in 1889. The following year was spent as an intern in the Royal Victoria Hospital, after which he went into private practice at Burlington, Vermont. From there he went to New York where he served in the Manhattan Eye and Ear Hospital and in the New York Polyclinic Hospital. Later he engaged in private practice, specializing in ophthalmology.

The death of Dr. George R. Camp occurred at Sheffield, N.B., on January 14th, 1917. Dr. Camp was born at Jemseg, N.B., on February 5th, 1850. He graduated at Bowdoin Medical College in 1890 and began to practise at Sheffield the same year. The late Dr. Camp had been ill since August, 1916, with malignant disease of the stomach. Dr. Camp enjoyed a large practice. He was a shrewd diagnostician and an ideal family physician.

Dr. James H. Cotton, of Toronto, who died on January 9th, had been in poor health for some years. He was born at Garafraxa on July 20th, 1849, and graduated from the University of Toronto in 1875. He subsequently spent two years in postgraduate work at the University of Edinburgh and returning to Canada began to practise in Toronto. He was a member of the staff of both Grace and Western Hospitals for some time. He is survived by a widow, one son and two daughters.

Dr. Harry Gray Fairbanks, whose death occurred at Harcourt, New Brunswick, on December 1st, was a son of the late Mr. Edwin Fairbanks of Halifax, at one time deputy provincial secretary of Nova Scotia. Dr. Fairbanks graduated from Dalhousie University in 1895 and was in practice at Harcourt.

News

MARITIME PROVINCES

The annual meeting of the New Brunswick Board of Health took place at Fredericton on January 5th, when a revision of the regulations governing the quarantine of cases of infectious disease was decided upon and a committee appointed to consider the matter. The members of the committee are: Dr. L. M. Curran, of St. John, Dr. B. M. Mullin, secretary of the provincial board of health, and Mr. Daniel Mullin, K.C., of St. John.

The provincial sanatorium at Kentville, Nova Scotia, is to be enlarged to provide accommodation for one hundred soldiers who have returned from the front.

It is reported that several cases of smallpox have occurred at Bungay, Prince Edward Island.

ONTARIO

A satisfactory report of the year's work was submitted to the Ottawa Board of Health by Dr. Law, the acting medical officer of health, at the annual meeting on December 13th. The present population of Ottawa is estimated at 100,561. The total number of births registered during 1916 was 2,542,—a birth rate of 24·20 per 1000. The average death rate was 15·34:1000. One hundred and eleven deaths from pulmonary tuberculosis were reported, an improvement upon 1915 when 133 deaths were caused by this disease. Diphtheria, too, was somewhat less prevalent than during the previous year, the deaths from the disease numbering 32 as compared with 53 in 1915. Ottawa did not escape the epidemic of measles which spread practically all through the country, but out of 869 cases reported only 8 deaths were registered. The situation as regards typhoid has been particularly satisfactory since only 12 cases—of which 4 were fatal—were reported in the city. The total number of deaths of children under one year of age was 566, an increase of 59 over last year. However, 132 of these infants died at the Foundling institution to which babies are admitted from all the districts surrounding Ottawa, so that these deaths should not be included in the Ottawa figures. With this deduction the infant mortality was 171: 1000.

Dr. Kendall, house surgeon at the Ottawa Isolation Hospital, has resigned.

Dr. Robert Macgregor, of London, Ontario, has been appointed prison physician at the Jackson Penitentiary, Michigan. Dr. Macgregor was recently pardoned after four years' imprisonment on a conviction of murder.

Dr. J. G. Wright, formerly of the staff of the Rockwood Hospital for the Insane, has been appointed to succeed Dr. Body as medical superintendent of the Kingston General Hospital.

The following is the list of contagious and infectious diseases reported in the province during December: smallpox, 4 cases; scarlet fever, 149 cases, 4 deaths; diphtheria, 438 cases, 38 deaths; measles, 449 cases, 2 deaths; whooping cough, 189 cases, 5 deaths; typhoid fever, 63 cases, 8 deaths; tuberculosis, 149 cases, 70 deaths; infantile paralysis, 5 cases, 1 death; cerebro-spinal meningitis, 9 cases, 7 deaths.

The Ontario Health Officers' Association will meet in Toronto on Tuesday and Wednesday, the 29th and 30th of May, 1917.

The following candidates have been successful in passing the examinations of the Ontario College of Physicians and Surgeons and have received license to practise in that province: James Franklin Adams, Hanover; Frederick G. Bantling, Alliston; William W. Barraclough, St.John, N.B.; George W. Beaver, Lewiston, N.Y.; Henry Norman Bethune, Toront; Charles Noble Black; Toronto; William Albert Blake, Hamilton; Frank Hubert Boone, Toronto; William Easson Brown, Toronto; Chas. M. Burroughs, Winnipeg; Beaumont Sandfield Cornell, Athens; Gordon Murray Dobbin, Toronto; Thomas Lorne Dobson, Utonia; John S. Douglas, Dunnville; Hugh Alexander Elliott, Midland; Charles Farquharson, Agincourt; Douglas Gordon Findlay, Toronto; Donald R. Finlayson, Lucknow; Victor Percy Fleming, Hamilton; Charles Elias Frain, Norwich; Ruggles George, Toronto; Joseph A. Gilchrist, Toronto; Roy John Hardstaff, West Devonport, Tasmania, Australia; Frederick W. W. Hipwell, Alliston; Edgar R. Hutchinson, Sarnia; Arthur Isaacson, Toronto; William G. Jamieson, Camborne; Andrew Murray Jeffery, Toronto; Fred Macnab Johnson, St. Thomas; Wilfred J. Johnston, Craigvale; Charles S. Macdougall, Kincardine; Angus MacKay, Woodstock; Robert MacKinlay, Camlachie; Donald Stirling MacLennan, Albert Montgomery, Toronto; Virgil P. MacMahon, St. Catharines; Cecil Verner Mills, Corunna; James Clarence McClelland, Toronto; Emerson C. McFarlane, Stratford; Thomas Vincent Plews, Cobourg; Ernest Aikens Richardson, Toronto; George Raymore Scott, Peterboro; Clarence Morley Sellery, Cobourg; Wilmot E. L. Sparks, Toronto; J. Cameron Smith, Lakefield; William Pelton Tew, Oil Springs; Newton Oscar Thomas, St. Thomas; Charles E. Thompson, Hamilton; Thomas Edmond White, Hamilton; Harvey John Wildfang, Elmwood; Harry C. Robertson, Toronto.

QUEBEC

THE twenty-second annual meeting of the Board of Governors of the Royal Victoria Hospital, Montreal, took place on January 16th, 1917. It was reported that patients to the number of 6,075 had been admitted to the hospital during the year, of whom 1,794 received free treatment, 2,566 were admitted to the public wards, and 1,715 had private rooms; 4,556 were residents of Montreal and 1,519 resided in neighbouring districts. The average number of days spent in hospital by patients was 20, and 123,967 days of treatment were given, as compared with 107,927 in 1915. Deaths to the number of 295 occurred during the year, the percentage being 4·9, or, if those which occurred within forty-eight hours of admission were deducted, 3·07. The average cost of maintenance for each patient was $2.18 a day, seven cents less than during the previous year.

The Board of Governors of the Western Hospital, Montreal, held its forty-fourth annual meeting also on January 16th, when the president, Mr. D. Lorne McGibbon, was able to make the satisfactory announcement that although 1916 had been the busiest year in the history of the hospital, the overdraft at the bank had been reduced from $46,000 to $17,000, the sum of $60,000 having been subscribed during the campaign for funds conducted a few months ago. The present buildings are not large enough to meet the increasing requirements, and a committee has therefore been appointed to consider the best means of dealing with the situation. The average daily cost of maintenance during the year was $2.47 for each patient. The number of admissions to the hospital was 1,567 including 1,413 residents of Montreal. Twenty-eight deaths occurred, the percentage being 2·77. In the outdoor department treatment was given to 18,225 cases. Dr. Peter S. Campbell, of the resident medical staff, is acting medical superintendent of the hospital during the absence of Dr. Alan F. Argue, C.A.M.C., medical officer of the 244th Battalion.

A disastrous fire occurred at St. Ferdinand de Halifax in the province of Quebec on Saturday, December 30th, when the asylum convent and church were burnt to the ground. The extreme cold added to the miseries of the situation, the temperature being below zero at the time, and it was with great difficulty that the rest of the village was saved. One hundred and thirty-nine patients were rescued from the burning asylum building but, unfortunately, it was impossible to save them all and forty-two met their death. The difficulties of rescue were tremendous owing to the inability of the insane patients to understand the danger or to obey orders given by the Sisters in charge, one of whom died of suffocation in a brave attempt to reenter the building. A number of congenital idiots were confined in a part of the asylum to which it was impossible to get in time to save them all; however, fourteen of these helpless imbeciles were carried to safety by the Sisters.

ALBERTA

Dr. H. W. Wall, of Donalda, is spending the winter with his family in Southern California.

A municipal hospital was opened at Bassano, near Calgary, on December 19th by the Honourable Wilfrid Gariepy. Dr. G. A. Scott is the medical superintendent of the hospital.

MEDICAL COLLEGES

Dalhousie University

On December 23rd, the Senatus Academicus of Dalhousie University held a special meeting for the purpose of conferring the degrees of M.D., C. M. upon the following gentlemen who have volunteered for active service overseas:

Donald St. Clair Campbell; John George Duncan Campbell, John Angus Davies, Charles Knowles Fuller, Dexter Scott McCurdy, Wilfred Murray MacDonald, Kenneth Grant Mahabir and Douglas William Norman Zwicker.

These Fifth Year students had taken advantage of the Special War Emergency Session from May 1st to December 31st, 1916 offered by the University acting under the advice of the Medical Department of the Militia authorities at Headquarters.

Recognising the patriotic motives actuating the University and the students, the Provincial Medical Board of Nova Scotia heartily coöperated with the University in holding an extra-ordinary joint special Final Examination in the end of December to enable the successful candidates to obtain their degrees and Provincial Licences by the end of the year and so enter at the earliest possible moment for the course of Military Instruction preparatory to their going overseas.

The report of the examiners showed that the graduating class had attained an exceptionally high level of distinction.

ARMY MEDICAL SERVICES

Mention has already been made in the Journal of the award of the D.S.O. to Major Philip Burnett, C.A.M.C., of Montreal, for conspicuous gallantry and devotion to duty in the field. The official notice of the award states: Major Burnett "took over the command of the bearers at the front, and for forty-eight hours carried out his duties with great skill and determination under very heavy fire." Major Burnett, who is lecturer in dermatology in the faculty of medicine of McGill University and dermatologist to the Royal Victoria Hospital, Montreal, organized No. 6 Field Ambulance in Montreal in the spring of 1915 and went overseas as second in command of that unit. He has been on duty with his unit ever since and is now in France.

The D.S.O. has also been conferred upon the following Canadian medical officers:

TEMPORARY COLONEL ARTHUR EVANS SNELL, C.A.M.C.
LIEUTENANT-COLONEL WILLIAM WEBSTER, C.A.M.C.
LIEUTENANT-COLONEL ROBERT PERCY WRIGHT, C.A.M.C.

Dr. Webster has been at the front for more than a year and is in command of an ambulance corps, which was mobilized in Winnipeg under his direction.

Dr. Wright went overseas with the First Field Ambulance, C.E.F., of which he is now in command. He graduated from McGill University in 1908.

THE following Canadian medical officers have been decorated with the Military Cross by His Majesty the King for conspicuous bravery on the field of action:

LIEUTENANT WILLIAM NORMAN GILMOUR, M.D., R.A.M.C., of Brockville, Ontario, who "gallantly dressed a wounded man lying in No Man's Land and finally brought him in with great courage under very heavy fire." Lieutenant Gilmour is a son of Mr. and Mrs. W. A. Gilmour of Brockville; he has seen much heavy fighting on the Somme front as medical officer of the 16th Royal Scots. He graduated from McGill University in 1910, served a year as house surgeon at the Children's Memorial Hospital, Montreal, and two years as surgeon on an Atlantic liner. He then went to Australia and from there to South Africa where he went through the German South West African campaign, at the end of which he joined the Royal Army Medical Corps and was appointed medical officer of the regiment with which he is now serving. He has since been promoted to his captaincy.

CAPTAIN ANGUS ALEXANDER DRINNAN, C.A.M.C.

CAPTAIN FREDERICK WILLIAM LEES, C.A.M.C., of Eburne, British Columbia, medical officer of the 7th Battalion of the First Canadian Division. Dr. Lees was born at Fallbrook, Ontario, and graduated from McGill University in 1908.

CAPTAIN GEORGE GARNET GREER, M.D., C.A.M.C., of Peterborough, Ontario. "For conspicuous gallantry and devotion to duty. He tended and dressed the wounded for two hours in the open under intense fire. On several occasions he rescued wounded men in the open by carrying them on his back. He has previously done fine work.

CAPTAIN ROBERT MARSDEN LUTON, C.A.M.C.
CAPTAIN JAMES ERNEST MCASKILL, C.A.M.C.
CAPTAIN WILLIAM FREEMAN NICHOLSON, C.A.M.C.
CAPTAIN (acting Major) PAUL POISSON, C.A.M.C.
CAPTAIN WALFORD DOUGLAS SOMERLED RORISON, C.A.M.C.

CAPTAIN LLOYD REMINGTON MEECH, R.A.M.C., formerly of the C.A.M.C., who "worked forty-eight hours under heavy fire collecting the wounded."

TEMPORARY LIEUTENANT CHARLES STUART WYNNE, M.B., R.A.M.C., of Toronto, medical officer of the 12th Middlesex Imperial Regiment, was awarded the Military Cross "for conspicuous gallantry and devotion to duty" at the battle of Thiepval. "He worked all night tending and dressing the wounded in the open, thereby saving many lives. Later, he carried out his fine work continuously for three days."

THE following officers of the Canadian Army Medical Corps were recently mentioned in despatches by Field Marshal Sir Douglas Haig, commander-in-chief of the British forces on the western front:

COLONEL GILBERT LAFAYETTE FOSTER, C.B.
COLONEL ARTHUR EDWARD ROSS, C.M.G.
COLONEL HERBERT STANLEY BIRKETT, C.B.
LIEUTENANT-COLONEL R. J. BLANCHARD.
LIEUTENANT-COLONEL E. B. HARDY.
LIEUTENANT-COLONEL H. M. JACQUES.
LIEUTENANT-COLONEL C. A. PETERS.
LIEUTENANT-COLONEL W. WEBSTER, D.S.O.
LIEUTENANT-COLONEL R. P. WRIGHT, D.S.O.
LIEUTENANT-COLONEL T. W. YOUNG.
MAJOR E. H. BLAYLOCK.
MAJOR P. BURNETT, D.S.O.
MAJOR L. C. HARRIS.
MAJOR A. E. SNELL, D.S.O.
CAPTAIN N. J. BARTON.
CAPTAIN R. H. HARDISTY.

Captain H. Hart.
Captain R. St. J. MacDonald.
Captain D. E. Robertson.
Captain S. G. Ross.
Captain W. H. Scott.
Captain J. P. Walsh.

Non-commissioned officers. Quartermaster-sergeant H. G. Iliffe, Sergeant E. C. Amaron, Sergeant C. W. McGill, Sergeant A. J. Quinn, Corporals T. Dale, W. Agnew, A. Donaldson, C. R. Grinham, W. E. Hewitt, Lance-corporals B. James and J. McLaren.

Nursing Sisters. Sisters A. Baillie, G. Billyard, R. Davies, A. R. Hinchey, F. H. McLeod, M. F. Parkins, L. Pidgeon, M. Robertson, B. L. Smellie.

The Military Medal has been awarded to the following members of the Canadian Army Medical Corps: Sergeant R. Cameron, Corporal A. Hogg, Privates J. Blair, J. E. Blaney, W. Blaney, J. Bois, A. Bowie, and E. C. Caldwell.

Dr. Leo Blagdon, of Quebec, has been appointed Assistant Director of Military Hospitals, Paris, France. Dr. Tufster, of Paris, is the Director.

The Royal Red Cross of the first class has been awarded to Matrons A. J. Hartley, L. M. Hubley, V.C. Nesbitt, E. C. Rayside, and F. Wilson, of the Canadian Army Medical Corps. The same decoration, second class, has been conferred upon Nursing Sisters A. D. Allen, A. Dickson, F. Ellwood, M. Hare, F. A. Hunter, and J. M. MacDonald.

Dr. W. W. Chipman, of Montreal, has been appointed to assist Lieutenant-Colonel Thompson, M.P., the medical officer of the Military Hospitals Commission.

Major G. G. Corbet, C.A.M.C., of St. John, New Brunswick, has returned from the front and is now in command of a field ambulance depôt at St. John.

Captain A. E. Lundon, C.A.M.C., is medical officer of the Indian Royal Horse Artillery.

Colonel H. Kemmis Beatty, C.A.M.C., has been appointed

A.D.M.S. at Brighton, England, in succession to Lieutenant-Colonel Watt who has been transferred to London.

Captain J. N. MacRae, C.A.M.C., of Galt, Ontario, late adjutant of the 34th (Western Ontario) Battalion, is now acting adjutant of the Central Military Hospital at Shorncliffe.

Colonel Prowse, C.A.M.C., of Winnipeg, is the Commanding Officer of the Patricia Convalescent Hospital recently opened at Ramsgate.

Captain Haig, C.A.M.C., of Belleville, Ontario, has been appointed medical officer of the 235th Battalion.

The following doctors have left Canada for overseas service: Dr. John Bunfield of Ottawa, Dr. A. H. MacLaren of Calgary, Drs. A. E. Cantelon, L. A. Knight, J. S. Sutherland, S. K. Shirton, S. C. Wilson, E. P. Whelpley, P. J. O'Dwyer, A. L. Shanks, and R. W. Guillemette, of Winnipeg.

It is announced that a further investigation is to be made into the administration of the Taplow Hospital and that Colonel Harwood has been appointed president of the Board of Enquiry.

The third meeting of the Canadian medical society recently formed in France took place on November 6th, in the lecture hall of the medical faculty of Paris University under the presidency of Lieutenant-Colonel François de Martigny. Professor Bérard read an interesting paper on the treatment of wounds of the knee in war.

The Distinguished Conduct Medal has been awarded to Sergeant A. E. Wartman, Corporal L. Bradley, and Private R. S. Collin, of the Canadian Army Medical Corps.

Captain W. S. Harper, C.A.M.C., of Madoc, Ontario, who was medical officer of the 155th Battalion, has been appointed to the Headquarters Staff at Ottawa.

Dr. Fred Burnham, of Winnipeg, has left England for Macedonia, where he will take command of the Serbian Military Hospital. Dr. Burnham saw service with the British Red Cross in Montenegro and was attached to the staff of a base hospital there at the time of the Montenegrin retreat. He has on two occasions been decorated by the King of Montenegro.

CASUALTIES

Died

Colonel Charles W. F. Gorrell, C.A.M.C., of Ottawa, formerly Officer Commanding the Duchess of Connaught Canadian Red Cross Hospital at Taplow.

Lieutenant-Colonel R. C. McLeod, C.A.M.C., Officer Commanding No. 9 Stationary Hospital, C.E.F., died of meningitis in London on January 6th, 1917.

Medical Societies

HAMILTON MEDICAL SOCIETY

The annual meeting of the Hamilton Medical Society was held in the Royal Connaught Hotel on December 6th, and took the form of a business meeting followed by an informal supper and smoker. The election of officers for the year 1917 resulted as follows: president, R. Y. Parry; vice-president, Dr. Forde McLoughlin; corresponding secretary, Dr. Fred Harper; recording secretary, Dr. D. A. MacRobbie; treasurer, Dr. T. W. Blanchard.

HALIFAX MEDICAL SOCIETY

This Society met on Wednesday, December 13th, at the Military Hospital, Halifax, Professor Fraser Harris in the chair. Several interesting cases were exhibited. Dr. A. J. Nicholls, Professor of Pathology, demonstrated the egg cases of the larval store of the *Bilharzia parinte* in the urine.

Dr. Chisholm demonstrated the final results of the very successful operations on the legs and feet of the men enlisted from the West Indies who were attacked by frost-bite on board ship. Dr. Chisholm and Dr. Carston performed the majority of the amputations: the stumps have been found admirably adapted for fitting to the artificial limbs. An interesting case was one of shell-shock with cortical deafness of some months' duration.

On January 19th the Society entertained Colonel (Dr.) Hugh Cabot, professor of surgery at Harvard University to lunch on the occasion of his visit to lecture before the Canadian Club. Dr. Cabot is in command of the Harvard surgical unit serving in France with the B.E.F. Professor Fraser Harris, president of the Medical Society, was in the chair. There was a large gathering of representative medical men. Amongst the guests were: His Honour Lieutenant-Governor Grant; the President of Dalhousie University, the American Consul-General; the President of the Canadian Club; the Hon. Mr. Justice Russell, Dr. W. W. Kenny, superintendent of the Victoria General Hospital. Dr. Cabot, in replying to the toast of his health, gave a most interesting and detailed account of the new surgery being followed out at the War. He described, compared and criticised the method of Cassel and of Wright especially from the standpoint of the newer methods of disinfecting wounds. It appears that dry dressings are inapplicable, the microörganisms of tetanus and of gas gangrene having gained access to every wound. The soil and clothing is highly infected with anærobes. In the evening Dr. Cabot addressed a large gathering of the Canadian Club of Halifax. His subject was: "The effect of the War on the British Empire as a Whole." From first-hand observation the lecturer gave a masterly review of the war, and ventured on an encouragingly optimistic forecast.

PETERBOROUGH MEDICAL SOCIETY

A MEETING of the Peterborough Medical Society was held on December 14th, with a very large attendance of the members.

The paper of the evening was given by Dr. Ford of Norwood, and was entitled "An analysis of three thousand cases of confinement." A discussion was opened by Dr. Scott, and carried on by Drs. Greer, McCulloch, Cameron and Clinton. A hearty vote of thanks to Dr. Ford was proposed by Dr. Amys, seconded by Dr. Eastwood.

The first meeting of the Peterborough Medical Society for the year 1917 was held on January 11th, and in spite of the very cold and stormy night, a large number of the members gathered to hear the papers given by Drs. Detweiler and Mann, of Toronto University, which were very much appreciated. A vote of thanks was proposed by Dr. McCulloch, seconded by Dr. Morgan. The next meeting will be held on February 8th.

THE MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE first meeting of the Society during the present session was held Friday October 6th, 1916, Dr. W. S. Morrow, the new president, in the Chair. The address of the Retiring President and the annual report of the Secretary were read. Resolutions of condolence were passed on the death of Dr. G. Wilkins, a past president of the Society, and Lieutenant-Colonel R. P. Campbell who was killed on active service, for ten years treasurer of the Society.

After the address the meeting took the form of an informal smoker.

The second regular meeting of the Society was held Friday, October 20th, 1916, Dr. W. S. Morrow, president, in the Chair.

In view of the appearance of several cases of acute anterior poliomyelitis in Montreal, the regular programme of the evening was changed to take the form of a symposium on that subject.

Dr. A. D. Blackader opened the symposium with a paper on the historical data of the subject, Dr. C. F. Martin reviewed the subject to date and Dr. A. MacKenzie Forbes discussed the subject from the standpoint of the surgeon. These papers are published in the foregoing pages of this issue.

Discussion: Dr. H. B. Cushing: It might be of interest to say a few words on the cases as presented at the Alexandra Hospital since August, 1916. About the first of last August Health Department of Montreal asked the Alexandra Hospital for accommodation for cases of infantile paralysis which might occur, and a ward was set aside for this purpose. On the 9th of August the first case was admitted and from then to the present there have been twenty-five definite cases in the ward. The care of this ward was assigned to myself and I thought it might be of interest to the Society if I said a few words on the features of these cases which have ocurred within the last two months. As to the part of the city from which the cases were derived I have here a map showing the locations—the red pins represent the cases sent to the hospital, the blue pins cases which I have heard of and which have been reported to the papers and not sent to hospital. The map shows that there was more or less definite evidence of contagion, that is, cases occurred in groups close together; one on one street, ten days later another almost across the road and still another later in the same locality, and we could almost assume as positive that there was infection from one to the other. On one street there were eight or nine cases within a few days of each other. In only one instance was there a history of two cases in one family, the second case was admitted to the hospital and there was a definite history that the other child had had the disease ten days before. Twenty-three of our cases were under five years of age, the other two were in young adults. The analogy between this disease and diphtheria is striking as seen at the Alexandra Hospital. In diphtheria the bulk of the cases are under school age, it is exceptional to get a history of exposure and exceptional to have more than one child in a family with diphtheria. This is exactly the same with poliomyelitis; even its method of infection through the nose and throat being similar . Early diagnosis is a fairly difficult matter unless flaccidity is present. Four of the cases admitted to the Alexandra Hospital eventually proved not to be poliomyelitis. In one child there was fever and loss of power in one leg, but this turned out to be a tuberculous knee and not paralysis. When we have these doubtful cases and it is a question of sending them to the hospital the seriousness of any error becomes obvious. This absence of any definite sign by which we can swear to a case is a very serious problem; the paralysis is the only sign which we can rely upon as pathognomonic. In the cases we had at the Alexandra the paralyis always appeared on the third day. As to the symptoms, in only seven was there a history of vomiting at the onset; the rigidity of the neck was noted definitely in half the cases; only two of the cases had convulsions, not more than you would expect in any febrile disease in children, these ran a relatively mild course afterwards and went on to complete recovery. In quite a few of the cases there was profuse sweating continuing for a number of days; whether this was due to the fever alone or some vaso-motor disturbance I could not say. I was surprised to find how high and how continuous was the course of the fever; in one it lasted about three weeks altogether, in another the patient finally died of hyperpyrexia. There was paralysis in sixteen cases of more than one extremity, in nine only one was involved. Pain was a marked feature. This did not seem to be a true hyperæsthesia, at least of the skin, but more a pain on movement of the limb and referred more to the joints, as if the relaxation of the muscles caused any movement to give pain. If you move the paralysed extremities at all it causes the children to cry out, and nursing is most difficult on account of this symptom. Dr. Martin mentioned that they usually lie on their side to protect the neck; that was not my experience as the nurses reported that it was very hard to get the patient to lie on the side, as pressure of one limb on the other gave rise to pain. There were five deaths out of the twenty-five cases, or a percentage of twenty. All the deaths occurred directly or indirectly as the result of a paralysis of the respiratory muscles. One thing to which I might draw attention was that it was the most cheerless ward I ever attended. The patients suffered great pain, there was extreme difficulty in handling them on this account, many cried constantly and did not sleep at night, or if they did sleep they would wake up at very short intervals crying. There was no treatment which seemed efficacious at all and the children who did not die went out at the end of the time in a condition not much improved from the time they came in. Again, the cases which had signs of difficult breathing lingered on from day to day and finally died practically from suffocation. This altogether made a gloomy picture and the nurses in the ward suffered in regard to their nerves while attending these little patients. One point that appealed to me was the evidence of the virulence of the disease. I had seen previously in hospitals scattered cases of poliomyelitis but the virulence of the present cases seemed very much worse than that of cases of other years; the fever is more prolonged, the paralysis more extensive and the mortality is greater.

Dr. Cushing presented a brain and cord from one of the cases showing the typical lesions.

Dr. S. Boucher: I was very pleased to receive the invitation of this Society to be present to-night and accepted with great pleasure. I have enjoyed exceedingly the papers which I have had occasion to hear and now feel much more encouraged than I did when I came in. The announcements made of the extreme difficulty in making a correct diagnosis of this disease make the outlook dark and it may be necessary to consider as cases of poliomyelitis all kinds of infection in young children which have these vague symptoms, until a correct diagnosis is made. In consequence of this the attention of physicians will be called to the danger of spreading this disease if left undiagnosed, and suspicious and doubtful cases will be more carefully reported. I have prepared a few figures about the situation as it stands now in Montreal. For the year there were reported to the Board of Health sixty-seven cases, as follows:

January	0
February	2
April	1
May	1
June	2
July	2
August	10
September	21
October	28
	67

Among these cases twenty-eight are now under treatment, eleven are in hospital and seventeen at their homes. According to the reports there have been twenty-two deaths. As to age, there have been:

Under 6 months	3 cases
from 6 months to one year	9 cases
from 1 year to 18 months	5 cases
from 1½ to 2 years	9 cases
from 2 to 2½ years	11 cases
from 2½ to 3 years	8 cases
from 3 to 3½ years	5 cases
from 3½ to 4 years	3 cases
from 4 to 4½ years	6 cases
from 5 to 6 years	1 case
from 6 to 6½ years	1 case
from 6½ to 7 years	1 case
from 7 to 8 years	1 case
from 8 to 11 years	1 case
from 11 to 12 years	1 case
from 22 to 23 years,	2 cases

Amongst these sixty-seven cases you will notice that but eight were over five years of age, all the other cases were under. Among all those children there was only one attending school, a small private school, and no other case developed there according to the reports.

The measures we have taken to prevent the spread of the disease were based on what has been done in New York. We have taken the report of the New York Board of Health and have followed as far as possible their action in this matter. We did not take up the matter of pet animals in the houses, though we might have done so to advantage. Opinions vary but we, as a Board of Health, must in every case take the safe side and on account of this we ask every physician in the city of Montreal to report all cases to us, doubtful or otherwise, as soon as possible. I put the matter before the Board of Control of the city so that we might have power to do everything in a thorough and satisfactory way, so that in the examination of cases that will be reported, especially if they are doubtful, I shall ask the Universities of Laval and McGill to choose one or two of their members to confer with the Officers of the Health Department. You are aware of the precautions taken by the Department for cases confined in their homes but I must ask you, because we need very much your help in that way, to be very careful to give as much explanation as possible to the families as to the precautions that they have to take. You could do in that way much more than we can. We cannot be with the people all the time; you see them often, and I would ask you to be insistent in the carrying out of your instructions and also those of the Health Officers. As far as possible I ask you to send the patients to the hospital, in this way it is much easier to prevent the spread of the disease than when they are treated in their homes; we cannot keep a watchman at every house all the time and the hospital is certainly the best place for such cases.

Dr. J. A. Hutchinson: I have only a few words to say about our outbreak in Westmount. At the outset I would mention that one of our members, Dr. Patch, has lost a child, a victim of the present outbreak, and I am sure the members of this Society all feel sympathy for him. We in Westmount have for some time had the usual number of scattered cases that a place of this population would have, but a sudden outbreak occurred a week ago, not perhaps so serious in number as in virulence; four cases developed in one day and three died. The School Commissioners, without waiting for any Board of Health to take action dismissed the schools and took other precautions. In order to satisfy everybody the Board of Health went on the principle of doing everything that it was possible to do, whether some of the things that were done were in excess of anything that was required or not. There are a few things that occurred that might be of interest. In a family where a death took place quite suddenly, the doctor told me that two other children in that family were ill, and had been ill for some time, but it had not occurred to him that they had had poliomyelitis until the death of this child convinced him that they must have been infected though they had not gone on to paralysis. This showed that such cases might occur and that the best physicians in the city might not be able to say that they were poliomyelitis. From this it would seem that in a city where there have been at least sixty-seven cases of genuine poliomyelitis, one may conclude that there may have been many others which did not go on to the extent of being paralysed but may have the disease and communicate it to others. Therefore, in reckoning up the number of cases we have only the actual cases which are paralysed. Another feature is that, though we have sixty-seven cases reported by members present to-night, there are other English physicians who are not here to report, and there is a very large body of French physicians from whom also we have not heard. The cases reported have occurred chiefly in the higher level of the city showing that this is not a disease that is much influenced by slums or insanitary conditions of a large city, the majority having been in homes where there is every sanitary facility.

Dr. G. G. Campbell: The slips passed around to the members to-night asking for the number of cases seen by them during the past three weeks show that there were sixty cases, fairly even'y distributed and there are eight or ten cases reported as doubtful. There are in the room to-night probably less than 100 physicians who are likely to come in contact with such cases. This showing is a most important matter at the present time and it is possible it is not taken quite seriously enough by our Health Authorities. It is easy to be wise after the fact but to take precautious now when some good might be done by it is most desirable. I have listened to what Dr. Boucher has said, and if that can be carried out I have no doubt it would help; but, for instance, during the present week in the Outpatient Children's Department of the Montreal General Hospital there were two cases of poliomyelitis, undoubted cases, the paralysis being present when seen on Monday of this week. These were both reported to the Health Department and the Department took what they considered the necessary steps to look after the cases: much to my surprise, however, on Thursday, when the Children's Clinic again opened, one of the same babies appeared at the clinic. How much damage she might have done in that outpatient department with twenty or thirty ailing children in the same corridor it is hard to estimate. It seems to me the only way to guard against such stupidity is to have such cases placed immediately in a hospital. The mother of the child told us that the City Health man had explained things to her, but she evidently did not understand the necessity for staying at home. With people of that class it is absolutely necessary to send the children to a hospital and the health officials should have authority to do so. About the disease itself, it has been my misfortune to have had seven paralytic cases with three deaths. Once I knew that the disease was prevalent I felt that one was bound to look upon every case of unexplained fever and illness in a child as possibly poliomyelitis. On the other hand if there is only one case in the family, as happened in three or four of my unexplained doubful cases, would I be justified in reporting that and in quarantining that family for six weeks? The diagnostic symptoms that Dr. Martin has drawn attention to are easy to obtain in older individuals. In two cases of nine and eleven years, one could test the difficulty in bringing the chin down on the sternum and it was present in these cases, but in children of two or even up to five years who are ill and irritable, one cannot get much out of them at the best of times and therefore cannot depend very much upon such symptoms. In such children there are few if any symptoms to be relied upon before the paralysis sets in. In one case, for instance, there seemed to be a regular gastro-intestinal upset in a baby with a strong suspicion of the milk as a possible cause; in another, which lasted only a couple of days, there was nothing but fever and lassitude in a baby under three years; in the third, in the same family, there was an unexplained temperature for two or three days, reaching 106°F., and three hours before death respiratory paraylsis set in and death took place with hyperpyrexia. This is the time to try to do everything in our power to have the cases recognised and to prevent the spread of the infection. I have no hesitation in saying that the most dangerous sources of spread of the disease are the moving picture theatres. An interesting example occurred in one of my cases. Two young boys, who had not been together for some time previously, went to a moving picture show a week before I was called to see one of them; they had not been together since and did not live in the same district, yet both developed poliomyelitis the same day and both died within forty-eight hours. All collections of children, younger children particularly, in schools churches, sunday schools, on street cars and play grounds, should be discouraged until we see just where we stand.

Dr. D. F. Gurd: An interesting fact in connexion with the recent cases is that they occurred within a day or two both in Montreal and Westmount. There may be a possible reason for this and it is being investigated at the present time. It certainly looks as if some common source of infection were present to cause these cases within forty-eight hours or so of each other. We have all learned a very great deal from Dr. Martin's address. He mentioned that the germ was supposed to be resistant to heat, dry heat; I would like to ask if he could inform us whether boiling or pasteurizing milk would kill it. Years ago no precautions were taken with cases of poliomyelitis. For the last thirty-five years I have seen and treated an odd case every year or two and they were seen in homes where there were other children and a second case never developed. The disease seemed to strike like lightning—here and there, and never twice in the same place. A peculiarity of these odd cases was that they occurred not only in the city but also in the country. One was that of a boy of ten, one of a large family, who had been six weeks in the country (Bark Lake) and who was suddenly striken and brought to the Royal Victoria Hospital where he died an hour or so after admission from paralysis of the muscles of respiration. Five years ago another boy a day or two after coming to Montreal from Lac Manitou, died from ascending paralysis. No other cases existed in this north country. Causation is obscure and cannot be traced in the above cases to contact. I believe that isolation and all other precautions should be taken but the fact remains, and Flexner made the statement in a recent report, that it is not very infectious—not nearly so much so as "measles, scarlet-fever, or diphtheria." This the older physicians can verify from their experience, as I said before in no case did a second child take the disease although they went in and out of the sick room. It is only within the last ten years that strict precautions were advised to prevent contagion spreading.

Dr. F. C. Gilday: New York city has had a very sad experience with this disease; they have found that in the acute stage they know nothing about it and in treatment they do not know anything but they have found out that all cases should be isolated and put under proper care; the after-treatment is the principal thing in anterior poliomyelitis. There are to-day distributed throughout New York City various institutions that can treat from seven to eight hundred cases and the best results have been obtained among the poorer class that go to these hospitals; the rich, treated at home, have the higher mortality. They keep these children there up to six months or a year. No active treatment is permitted until all symptoms have subsided, the longer it is left the better the result. Electricity aggravates the condition and prevents recovery. In the course of two months they know definitely the muscles that are paralysed and they then begin the education treatment, not the ordinary massage but the education and proper massage of muscles in the proximity to the paralysed muscle; get the child if it has a drop foot to work it every day and prevent deformity; watch the case. They are getting good results from that procedure and it has to be followed out in a scientific manner. These cases should be kept in hospital until all chance of deformity is prevented. Cases which leave early, untreated, will return to the outdoor departments of our hospitals probably for years; this can be prevented by proper supervision and if we are in for any kind of an epidemic here lines should be laid down as to the course that should be followed out. Dr. Whitman, an authority on the subject, sums up what they have learned—isolate the case, give courses of educational treatment and follow up closely; beware of early massage; electricity is not used.

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Annual meeting. Toronto, May 31st-June 2nd, 1917

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FUNCTIONAL REËDUCATION AND VOCATIONAL TRAINING OF SOLDIERS DISABLED IN WAR

By E. M. von Eberts

Surgeon to the Montreal General Hospital

THE responsibilities assumed by the allied belligerents in this war have increased in leaps and bounds; and, what is most remarkable, enthusiasm has kept pace with all demands, military and economic. Let us hope that this sense of responsibility and this great wave of enthusiasm will not end with victory, but will be wisely directed to the completion of the undertaking to deal justly and adequately with the human wreckage; to gather up, foster, and rehabilitate those fragments of the nation's manhood, that nothing redeemable may be lost to the state or to society.

In former wars the state held that it had discharged its whole indebtedness to a disabled soldier when it had granted him a pension. To-day political economists are convinced that something more fundamental and far-reaching is needed. The essential defect of the old system was that the majority of incapacitated soldiers subsequently, either from choice or from supposed necessity, lived in idleness. As a result, they were in many instances a permanent loss to the economic world. They became a burden either to their families or to the community, which had to make good in one way or another the difference between the pension and the normal living wage. Many of them ended by losing their self-respect and social standing. While recognizing that the payment of pensions must always be an issue of war, we have awakened to the fact that the evils which have hitherto been associated with the pension may

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through a coördinated system of functional reëducation and vocational training, be largely eliminated. The old sentimentality displayed towards disabled soldiers, which quickly expended itself and left the recipient with a depleted stock of moral stamina, is giving place to the healthier and essentially more sympathetic view, that an incapacitated soldier can and must again become self-supporting, and that the state, in addition to giving him a pension, must provide the educational means for such an economic rehabilitation.

At this point it might be well to state that the present theory of the pension is, that it should merely span the gap between the normal wage and that which, in the opinion of the government, the disabled individual should command. It is in no way intended to replace the normal wage, except in cases of complete incapacity.

Civilian institutions for the reëducation of persons who have met with mutilating injuries have existed for many years in France, Belgium, Russia, Scandinavia, and Bavaria; and the astonishing results obtained serve to demonstrate, for the purposes of the present widespread movement in connexion with the reëducation of disabled soldiers, the truth of the dictum that, with the will and the means to overcome it, there is no special permanent incapacity inherent in the disabled.

Of the Allies, the French were the first to recognize the necessity of extending their organization for the rehabilitation of disabled soldiers. Owing to the extent and severity of the war, the needs of the nation in this respect were insufficiently provided for; and, while public and private energies quickly produced numerous bodies to meet these needs, it soon became evident that their functions would be fulfilled more scientifically and with less waste of energy, were a more coördinated system devised. With this end in view, various legislative measures have been passed; others are in contemplation; and it is confidently expected that the legislation and organization finally adopted will be ideal.

The French organizations (as then existing) were reviewed some months ago by Major J. L. Todd of the Pensions Commission; and the information which I have to lay before you this evening is based largely upon Major Todd's report to the Director of Medical Services, Canadian Contingents, entitled "How France Returns her Soldiers to Civilian Life".

Since the necessities of the case are identical, Canada is, like Italy, Germany, and Austria, following the principles embodied in the French organizations.

The process of rehabilitation may conveniently be divided into the following stages:

1. Active medical and surgical treatment.
2. Functional reëducation.
3. The provision of artificial appliances.
4. Vocational training.
5. Establishment in civilian life.

We shall be concerned chiefly with the complementary phases of functional reëducation and vocational training, and with the question of artificial appliances.

By "functional reëducation" we mean the various measures adopted to secure a maximum of normal function in an injured part; and by "vocational training", the instruction given to disabled men to prepare them for the occupations which are most in accord with their aptitudes and social circumstances.

While functional reëducation and vocational training, which must often be coincident, can not in some instances be begun before the termination of active hospital treatment, no considerations of administrative convenience should be allowed to interfere with their commencement at the earliest possible moment in the course of a patient's progress. A mistaken sentiment is that which fosters the belief that disabled soldiers should be allowed to return to their homes as soon as hospital treatment has been completed, and before they have undergone a course of reëducation. This tendency should be strenuously combatted, and perhaps the best means of so doing is to grant the pension, where feasible, before vocational training is begun. Those who are responsible for vocational training in France, Germany and Austria, are convinced that it is inadvisable to permit a disabled soldier to return to his home before he has undergone reëducation. There are, of course, exceptional cases, in which, owing to the possession of independent means or the peculiar nature of the man's occupation or social status, no advantage is to be gained from such training. The conviction of those who have had the most experience, however, is that in the majority of cases, from every point of view—physical, mental, and sociological, vocational training or reëducation should be begun at the earliest possible moment and while the disabled are still under military discipline.

The creation in the patients of a proper outlook and a spirit of cheerful hope is considered to be one of the most important factors in reëducation; and every endeavour should be made to develop this outlook and inculcate such a spirit from the moment of admission to hospital. Men who, in daily response to the call of duty, have for months been ceaselessly balanced upon the edge of eternity are, when finally wounded or disabled, inclined to see no escape from a life of dependence upon a pension. Early and organized effort should be made to dispel this illusion; to convince them that by suitable reëducation, even though disabled, they can and must again become self-sustaining, and to persuade them that the duty of the state is not to support them, but to equip them with the means of earning a living wage. In the French hospitals, doctors, nurses and assistants in all branches are specifically instructed to speak cheerfully to patients, to impart hope, and to encourage the prospect of self-support.

In France methods of functional reëducation comprise mechanotherapy; gymnastics; graduated exercises; massage; treatment by galvanic, static, faradaic, and high tension currents; by baking or blasts of hot air; by baths; by vibration; and by coloured light.

The orthopædic centres are equipped with devices for active and passive mechanotherapy. The machines are for the most part actuated by force applied by the patient. Opinion is unanimous in condemning passive mechanotherapy, and in insisting upon the value of active movements initiated by the patient himself. Most of the machines employed are of foreign design, usually Swedish. Some of them, however, have been devised, wholly or in part, by the physicians who employ them. Those invented by Professor Amar are both cheap and efficient, and it is probable that in the future they will be much more widely used.

The exercises first given are simple ones, requiring little mental or muscular effort, such as those often employed in the reëducation of tabetics. To those who have been confined to bed for a long period and who have consequently lost poise and the habit of movement, these exercises are of very great benefit. Leg exercises comprise walking along lines, straight and irregular; stepping over obstacles of varying height and shape; ascending and descending steps with irregular treads. For the arms there are objects of various sizes and forms to be handled, and devices which require the hand to be put in different positions.

Next in value to the performance of voluntary movements is the judicious use of massage and heat. Although at present many of the nurses and assistants, male and female, who administer massage or other treatments in the French hospitals, have little technical knowledge, steps are being taken to give them sufficient instruction to ensure the proper discharge of their duties.

It is strongly urged by many that, apart from its psychic effect, properly selected and graduated work constitutes the best possible means of re-accustoming muscles to action. In many French hospitals workshops have been equipped by private societies. Other allied voluntary societies provide for the distribution and marketing of the salable articles, at a fair but not exorbitant price. Light work for the army, such as the making of bags and flares, and the hemming of towels, is done. In creating a taste for work and maintaining in patients a good frame of mind, these societies accomplish something of very real value. Furthermore, inasmuch as the work done by the patients yields a certain return, it re-awakens and fosters in them a desire to be again producing and earning a living wage. The intervention of war was not necessary to teach even the average observer the danger of unemployment. An important and apposite example is furnished by an analysis of the social progress of a group of injured German workmen who had received a monetary compensation proportionate to their injuries: it was found that the social status of practically all who had not secured work had deteriorated.

It is estimated that about 0·4 per cent. of the wounded will require vocational training. In probably 90 per cent. of these cases the vocational training will be determined by, and will but supplement, knowledge and dexterity in trade or profession already acquired. There will remain, however, a large number of individuals who have never possessed special knowledge or dexterity, and for whom the choice of occupation is of paramount importance. In such cases the individual must be assisted in his choice by those who have had experience in the estimation of abilities and aptitudes, and who have personal knowledge of the patient's inclinations and skill. All workshop training is under the direction of instructors who, apart from their technical knowledge, keep themselves informed as to the requirements of labour in the various industries. As inclination is the temperamental complement of skill, the aim of the instructor should be to train inclinations. Only in this combination does one truly find a vocation. Where training follows inclination, interest is not likely to lag. It speaks for the thoroughness of the French workshop organization that such great stress should be laid upon the selection of the special course of training advised in the individual case. Unless a disabled man has chosen his occupation wisely, and has become master of it, his employment will undoubtedly be most uncertain in the years, not far distant, when, with the gradual renewal of the economic struggle, sentiments of gratitude and sympathy are bound to disappear.

The supplying of artificial limbs to those who have suffered an amputation is also a serious problem. It is estimated that artificial appliances of some sort will be required by about 1 per cent. of the wounded. It is stated that from 2½ per cent. to 3 per cent. of the Belgian wounded have suffered amputation. The former figure is the French estimate. It is recognized that the state must supply and maintain in repair any artificial appliances necessary for disabled men, and also that such appliances must be made from the best quality of materials and according to the most suitable patterns. Plans and specifications of the appliances adopted by the Commission d'Orthopédie in France have been prepared and issued by that body, and all appliances supplied at the government's expense must be of these patterns. The models adopted are to be revised yearly. In order to secure uniformity these artificial appliances are to be issued at six centres only, and at each of these centres scale patterns of the appliances adopted will be maintained for the use and guidance of manufacturing orthopædists. The model types have been adopted after the most careful study. The diversity of the models permits a considerable latitude of choice to the orthopædic surgeons. In addition to artificial limbs, other appliances, such as skull caps and plates, are being employed for the protection of those who have undergone craniotomy; and springs of various types have been designed to replace muscles, the use of which has been lost.

In the French Army, of those whose limbs have been amputated, about three fifths have lost legs and two fifths arms. While the distribution of disabling injuries of the extremities would point to the reverse of these figures, the final results are due in a measure to the fact that, at the beginning of the war especially, men wounded in the arms were able to find their way to dressing stations, where they received treatment by which their arms were saved, whereas those wounded in the legs not infrequently lay on the ground for a considerable period, and reached the surgeon only when their wounds were infected and amputation was the only treatment possible.

Generally speaking, an amputation stump should have reached its permanent size and be ready for fitting by the time functional reëducation is completed. The first essential for the successful fitting of an artificial limb is the making of a plaster model of the stump. Upon this model the artificial limb is constructed.

In practice the fitting and construction of the artificial limb is undertaken from three to five months after the final operation. A provisional limb may be worn for a time to harden the stump and bring it to its final form. When this is not practicable, a reduction in size of the stump may be effected by massage and bandaging.

While it is easier to fit satisfactorily an artificial arm than a leg, the former can never so completely replace the lost member as as a well-fitted artificial leg.

The consensus of opinion at the present time seems to be that the simplest artificial limb is usually the best, and it is admitted that the aim of an artificial appliance should be to remedy not the anatomical but the physiological loss.

Because the loss of a leg is of less economic importance than the loss of an arm, less attention has been paid to the devising of artificial legs. The peg leg is still held to be the most useful for occupations requiring the exertion of any force. On the other hand, the artificial leg which looks like a real leg may be useful from an aesthetic point of view, to those, such as clerks, whose occupation requires that their appearance should be normal. The disadvantage of the peg leg for those who must walk over soft surfaces, farmers for example, has been partly overcome by the elaboration of a light sandal which can be clamped to the end of the peg. Legs made both of leather and of wood have been adopted by the French Commission.

While admitting that an artificial arm can never be much more than a support, Professor Amar expects that his arm, especially the steel forearm and claw, will give useful service, the latter in even the heaviest occupations. He states that he knows over one hundred armless men who are working successfully for ten hours a day and earning good wages in manual occupations. There are others, however, who insist that maimed men will usually get real service most easily from some simple device of their own or from the apt use of their stump. This opinion holds good for those who have lost legs as well as for those who have lost arms, and there appears to be some sound foundation for it. The frequency with which men use the stump of an amputated arm or leg for various operations, and discard their artificial appliance while at work, is remarkable. Innumerable instances might be cited of the ingenuity which quickly devises appliances for making easy operations which a mutilation has made difficult.

The unwillingness shown by disabled men earlier in the war to undergo a course of vocational training threatened to nullify the efforts of the French Government in their behalf. There seemed to be some apprehension that, if a disabled soldier increased his earning power through reëducation, the government would grant him a smaller pension. Furthermore, the benefits to be derived from reëducation were not thoroughly appreciated. To remedy this situation, the government issued the definite assurance that a man's pension should depend upon the extent of the incapacity resulting from his injury and not upon his earning power, and that they would assume not only the cost of instruction but also the cost of maintenance during the period of training. The sympathy and active coöperation of the public were secured by means of advertisement, speeches, lectures, and cinematographic films, setting forth the advantages, personal and economic, of a training which would fit the disabled to maintain his place in the social and industrial life to which he was returning. These measures have resulted in a steady increase in the percentage of wounded applying for reëducation.

In Canada the government has issued the assurance that a man's pension shall not be reduced because of his having increased his earning power through his own industry.

In conclusion let me reiterate the conviction of those who have had the most experience: that no disabled soldier should be permitted to return to his home without having first undergone a course of reëducation or vocational training.

SPHAGNUM MOSS FOR USE AS A SURGICAL DRESSING; ITS COLLECTION, PREPARATION AND OTHER DETAILS

AN ILLUSTRATED DEMONSTRATION

BY PROFESSOR J. B. PORTER

McGill University

THE September number of the well-known and justly popular London *Graphic* bore in conspicuous capitals on its front cover the question—"Are you collecting Sphagnum Moss?—see page 281," and thus brought before its large circle of Canadian readers what was to most of them a new word and a novel war activity

Scholars of Greek of course knew what Sphagnum used to mean, and botanists recognized the word as the generic name of the peat mosses, but even these learned people were probably surprised and somewhat incredulous when they read that "the collecting, drying and making into surgical dressings of sphagnum moss has become a national industry in Scotland"—that "the work is being extended all over Ireland, England and Wales," and that the Government through Sir Edward Ward, D.G.V.O., had established central depots all over Great Britain to receive and forward the material to the war hospitals which were "profoundly thankful for a dressing which is better than absorbent cotton."

Although I have introduced my subject by this quotation from the *Graphic* I do not labour under the delusion that that excellent paper is a standard work on Surgery, neither do I lack more weighty authority; I quote it simply because no previous publication had stated the case in so striking a way or to so large an audience. As a matter of fact sphagnum dressings made their appearance in the British press at least two years ago and since then have been much written about, but here in Canada at least, very few people seem to have heard of them and the majority of our medical men have been too intent on other matters to pay much attention to the

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occasional sphagnum articles in the *British Medical Journal, The Lancet* and other similar publications.

In spite of our incredulity or indifference the *Graphic* statement is apparently within the truth, and what is more to the point, not only are voluntary aid workers by the thousand collecting, and preparing, sphagnum, but after due experiment the War Office has formally approved of the dressings; the Red Cross has followed suit, and last; but not least so far as we are concerned, the Canadian Red Cross Commissioner in London has requisitioned a monthly supply of some thousands of dressings of Canadian sphagnum for the Canadian hospitals in the Shorncliffe and London areas.

Sphagnum is the basic plant of the peat deposits which for many years I have been studying in connexion with a research for the Canadian Government on the fuel resources of Canada. Thus when certain of my friends, including the late Sir Lauder Brunton, wrote last winter of the attempt that was being made to introduce sphagnum for surgical dressing purposes, it occurred to me that here was a chance for one who was too old to fight still to be of some use, and therefore I obtained through my correspondents specimens of "surgical" moss, and after learning all I could about the matter I set to work to search the different bogs in this country for suitable material. Even in the spring of 1916 the use of moss in the hospitals was still in the experimental stage and I had great difficulty in getting my specimens passed upon by the authorities. Ultimately, however, they reported on the samples, accepting some lots and rejecting others, and thus I found that in certain parts of Canada we had excellent surgical sphagnum. I then collected a few hundred bushels of the best moss available and persuaded the local Red Cross organization in Guysborough—the town nearest my country home in Nova Scotia, to prepare a large number of dressings to War Office specification, and a lot of these dressings was sent over to be tested in actual service.*

The work above outlined was of course private and altogether unofficial, but after proceeding thus far we turned the matter over to the Quebec Provincial Red Cross and they, with the help of certain affiliated organizations, are now making the dressings and arranging to send forward a regular monthly supply to the Canadian hospitals in England.

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*At the time of Dr. Porter's address no report had been received regarding this sample lot of dressings, but since then formal notification has been received that "they are of exceptionally good quality and of very high absorbency."

Sphagnum is the Greek word for moss, but at present is restricted by botanists to a single genus of about forty species and varieties all of which are found in sub-Arctic and cold temperate zones. They are at their best in Newfoundland, Labrador and other northern districts, but they also grow freely in central and eastern Canada and other similar districts on the European continent. The decayed or semi-decayed sphagnum accumulated in the bottom of bogs is the fundamental material of peat, and the living plants themselves are largely used in Europe, and particularly in Germany, for cattle bedding, packing material, and various industrial purposes.

The softer and finer qualities of sphagnum have been used since time immemorial in what might be called home-made surgery, and moss dressings are said to have been employed to a limited extent in the Napoleonic and Franco-Prussian wars; but since then little has been heard of them until after the present war began. We now know, however, that the German army medical people were using them before the war and that they are using them in large quantities at the present time.

The British use of sphagnum in army surgical work proper has, I believe, developed altogether within the last eighteen months. Dressings made by Cathcart in Edinburgh were apparently the first to be used, but I have no exact information as to dates and quantities. Dressings were apparently first furnished to the War Office last autumn, but even up to the middle of April of this year the supplies were relatively small. The Irish St. John's Ambulance Association, under the presidency of the Countess of Waterford, followed the Edinburgh society closely and created a sphagnum department in October or November, but this organization was only producing 5,000 dressings in April, whereas now it is supplying about 35,000 per month. Similar societies have grown up in England and Wales, and the total output of dressings had reached a very large figure even before the War Office and the Red Cross formally adopted them in the latter part of the summer. To show how rapidly the demand has grown I might refer to an article by Sir Alexander Ogston in the *National Review* for August. He estimates the probable number of casualties for the coming year, discusses the vast quantity of surgical supplies which will be required by the several belligerent nations, and concludes that within the next twelve months at least fifty million dressings should be prepared for the use of the various war hospitals. He makes it clear that he considers sphagnum superior to any other available absorbent dressing.

Whether his huge estimate is right or wrong it is clear that the demand will be so enormous that Canada with its large sphagnum resources, and its supply of willing Red Cross workers, should lose no time in getting to work.

Only two or three of our numerous species of sphagnum have proved suitable for surgical use, and of these one—S. papillosum, found thus far only in the Maritime Provinces, is far superior to all others. Some specimens of this plant show an astonishing absorbency and dressings made of the best dry moss will absorb twenty to twenty-two times their own weight in water before they begin to drip. Average moss will go as high as twelve at least, whereas absorbent cotton does not go above half even of this last figure. Another advantage of sphagnum is that it holds the absorbed liquid far better than cotton and does not get foul nearly so quickly, these valuable qualities being no doubt due to the fact that in sphagnum the liquid is taken into large cells with elastic walls instead of being merely held by capillarity between the fibres as in cotton. These exceptional absorbent powers are as true of pus and other liquid discharges as of water, and hospitals using moss find that their dressings do not require renewal nearly as frequently as ordinary gauze and cotton. Further the moss dressings are much lighter and less heating, and a great many observers call attention to these features as conducing greatly to the comfort of patients.

"I feel assured that sphagnum is *the* dressing for the Carrel Tube system. It is so light and absorbent."

Extract from a letter from Colonel Caird, Professor of Clinical Surgery in Edinburgh, now on duty in France.

"Sphagnum dressings require only a thin layer of gauze over the wound, or not even that if gauze is scare, as the gauze bag which contains the moss is practically sufficient. For all freely discharging wounds sphagnum dressings are much superior to cotton; for wounds with slight discharges either would serve the purpose."

Extract from a letter from the chief surgeon of a large British war hospital.

"Even the best prepared cotton, although in a sense very absorbent, lacks the power to retain discharges which is possessed by sphagnum moss. Thus whereas a pad of absorbent cotton allows these sanious discharges to penetrate and pass beyond to the bed clothes through a very limited portion of the dressing, or causes them, when thick, and purulent, to lie between its clogged surface and the wound, a pad of sphagnum absorbs and holds up the discharges until it becomes fully saturated.

"In civil hospitals in times of peace the deficiencies of cotton are not so much noticed. The majority of the wounds are those made by the surgeons themselves under ideal conditions and thanks to antiseptic surgery these wounds have only a slight discharge if any at all. Hence the fallacy of supposing that a dressing which meets requirements in a time of peace must be equally useful under all circumstances, including those of war."

Extract from a paper by C. W. Cathcart, senior surgeon Edinburgh Infirmary, June 16th, 1916.

The writer has been informed recently by one of the nurses at the Eastbourne Naval Hospital that sphagnum dressings were found very satisfactory, and were greatly preferred by the patients as they were less heating than cotton and therefore far more comfortable. They were also found particularly useful in cases of bad burns. The same informant said that splint pads made of second quality sphagnum were greatly preferred to cotton for fractures, as they retained their elasticity and were cool and very light.

Owing to the great variations in usefulness of different kinds of sphagnum, the material has to be collected by people who have been trained to know the good from the bad, and as the different species of sphagnum grow very much intermixed the collector will often have difficulty at first in deciding just what to take and what to leave. The method of collection is to wade out into the bog, grasp and pull up the upper layers of the moss by the handful, wring them out, put them in sacks and take them to the edge of the bog whence they are carted to some suitable place where they can be spread out to dry and have the rubbish picked out. The rough dried moss is then shippped to Red Cross work rooms where it is very carefully picked over and classified into three or more qualities. All the best stuff is put into muslin cases for dressings, the intermediate is made up into pillows, splint pads, dysentry pads, etc., the worst discarded. One has to be extremely careful about the first collecting, as the picking over of poor moss requires an enormous amount of labour and time, and produces very little material in the end. Throughout the work all possible precautions are taken to keep the moss clean and free from infection, but the general opinion seems to be not to attempt to sterilize the dressings here, but to leave that business to the hospitals. In the earlier months of the work Dr. Cathcart sterilized a considerable number of his dressings, about a fifth of his material, and the Irish Bureau about a tenth, the rest going forward unsterilized. Now I am informed that all of the British hospitals at least do their own sterilizing which is far more satisfactory.

In closing I may say that although this surgical use of sphagnum is extremely new, except in Germany, and is still to a certain extent experimental, yet already there are thousands of volunteer workers engaged on the preparation of dressings in Great Britain, and the two or three score of Canadians now interested can easily be multiplied by a hundred, if necessary, in the spring. There is no doubt that the material is greatly needed, and it is popularly understood that the supplies in Great Britain are insufficient to meet the demand. Official information as to this latter point is, however, being sought, and if the reply is such as we anticipate it is hoped that Canadians, particularly in the Maritime Provinces, will interest themselves heartily in the work.

The literature of sphagnum is far from voluminous if we except the popular, but irresponsible, statements which have appeared in the Scotch and English newspapers during the last year. Certain of the technical articles are, however, definite and satisfactory.

1. The first mention of sphagnum in connexion with modern surgery seems to have been in 1882 when Neuber and others published a series of articles in German beginning with an important paper in *Arch. für Klin. Chir.* Bd. 27, S. 757. These articles interested a number of British surgeons, but so far as I can learn were not re-published or even abstracted in English until after the war began when Professors Balfour and Cathcart published a translation with comments and recommendations:

2. "Bog Moss for Surgical Dressings," *The Scotsman*, November 17th, 1914.

3. The Neuber article was again reviewed in an excellent paper by Cathcart: "Cheap Absorbent Dressings for the Wounded," *British Medical Journal*, July 24th, 1915, pp. 137-8-9.

4. The question of the sterilization of sphagnum dressings is taken up by Cathcart in "Methods of Preparing Sphagnum Moss as a Surgical Dressing," *The Lancet*, April 15th, 1916, p. 820.

5. The general sphagnum situation is discussed at length in an important article by Sir Alexander Ogston: "Our Wounded—Sphagnum Moss as a Dressing," *National Review*, August, 1916.

There are numerous other references to the subject in the medical press, but so far as I know none of them are of any considerable technical importance. The following may, however, be mentioned:

6. *The Lancet*, October 16th, 1915, p. 898.
7. *The Lancet*, December 11th, 1915, p. 1316.
8. *British Medical Journal*, December 25th, 1915, p. 942.
9. *The Scotsman*, June 16th, 1916.
10. *British Medical Journal*, August 12th, 1916.

Supplementary Note by the Author

Since the above address was given the situation has developed considerably. Favourable reports on sphagnum dressings have been made by the commanding officers of several Canadian war hospitals, and definite requisitions for very large quantities of dressings have been received from the Director of Medical Services Canadian, in England, and from No. 3 Hospital in Boulogne, etc. On the other hand we are officially informed that the facilities for producing dressings in Great Britain and Ireland have so increased that Canadian supplies are not immediately required, although they probably will be greatly needed when the spring campaign begins. Finally the present submarine situation is such that there is some question as to whether it will be advisable further to burden our already overtaxed shipping with relatively bulky consignments of dressings.

The central executive of the Canadian Red Cross is dealing with the situation in a very practical way. A special Sphagnum Committee has been appointed to look into the whole matter. Standard specifications for collecting and preparing moss are being drawn up, an inspection department is being organized and the Provincial Red Cross Societies in Eastern Canada and particularly in Nova Scotia are much interested and will undoubtedly take full charge of the work of making dressings. By the time the snow melts and our bogs again become accessible, arrangements will have been completed for the production of whatever quantity of dressings may be required, and in this connexion it must be realized that even if transportation difficulties render it inadvisable to send large supplies overseas, the work now being done will not be wasted, as sphagnum dressings have proved to be so useful and so much cheaper than gauze and cotton that a considerable demand will unquestionably grow up in our own hospitals.

In conclusion it should be stated that while the Canadian Red Cross is thus undertaking serious and probably extensive work on this new material, it considers it very inadvisable for untrained persons to make up dressings. Experience in Great Britain has shewn that only certain grades of moss are useful and dressings made to any but the strictest specifications are likely to be worse than useless. It is desirable that all accessible bogs in Canada should be searched for suitable moss, and specimens sent to the Secretary of the Sphagnum Committee at McGill University will be examined and reported on without delay, but no attempt should be made to collect moss in quantity, still less to make dressings, except with the approval and subject to the inspection of the Provincial Red Cross authorities.

END RESULTS OF THE VARIOUS DISABILITIES OF THE RETURNED SOLDIER

By Captain E. Hobart Reed

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IN dealing with this subject we may place such disabilities into two general groups, i.e.: 1. Medical, and 2. Surgical; and as a subdivision of the first, the *Mental.*

In the first group the profession has been called upon to deal with a condition of which before the advent of the "Kultur of William" we have had a very meagre and superficial experience. I refer to those men who have been "gassed" and more especially to those who in the early days of the war fell victims to the chlorine gas. I perhaps should not say it was definitely chlorine, but in any event the physical properties of this noxious vapour very closely resembled those of chlorine. As to the acute stage of the poisoning, I can only give you the experience of some of those who survived. The prognosis depended very definitely upon the amount of gas inhaled, and on its composition. The period of suffocation and prostration are practically synonymous, in some cases the gas is taken into the stomach as well as the lungs and necrosis of the mucous membrane with the attendant lack of secretion in the severe types, and the hypersecretion in the milder cases soon follows. The treatment is chiefly symptomatic and supporting and the patients are sent to the convalescent homes as soon as their condition will permit. It is here that the opportunity for observing the after-effects is available. More or less discussion has been raised from time to time as to the proper locality for these patients to put in their period of convalescence. My personal opinion last January was that these men would do better at sea-level; several men were transferred to the Naval Hospital at Esquimalt, British Columbia. Some of these seemed to do well while others were not benefitted by the change. The most marked improvement occurred in those

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cases where "Shock" was a prominent feature. When these men first arrived at Ogden it was noted that practically all were suffering from aphasia to some degree, and as one man expressed it, "I can only get out a word now and then but I have the answer ready as soon as you finish the question." Cyanosis and dyspnœa were always present when under excitement and exhaustion followed the slightest exertion; clinically very little could be made out; there are always numerous rhonchi present with no impairment of resonance. Skiographic examinations revealed only slightly thickened pleura and prominent bronchial glands most noticeable in the mediastinum. One sequela of this condition noticeable by its absence is tuberculosis; in none of these cases have I been able to find any sign of this infection. These patients, as their condition improves, increase in weight, but their strength does not begin to return in the same ratio. Outside the shortness of breath on slight exertion the neurotic phase seems the most persistent. Some of the men have been under observation for over nine months and while improvement has taken place I know of none up to the present time who are fit to be taken on again for overseas service. The periods of dyspnœa and cyanosis have lessened and a slow general change for the better is evident in all, but it is impossible to say at this time what the final degree of recovery will be. A great deal of work will be done and is being done, but I think the best results have been obtained by the general use of respirators and masks, which emphasizes the old saying that "an ounce of prevention is worth a pound of cure".

With reference to pulmonary tuberculosis, very few men were returned during the early part of the war suffering from the disease. During the last eight weeks this form of disease has constituted nearly 50 per cent. of disabling conditions which have been sent into Military District No. 13. There may be two ways of accounting for this; in the first instance it is very probable that many men when enlisted may have been suffering from this malady in the incipient form. Far be it from me to cast any reflection upon the medical officer who may have passed these men as fit, for the physical examination of the recruits, while it is as thorough as possible to make in the time at one's disposal, obviously does not include an examination of either the urine or sputum. Even were either of these accessible, it is a very easy matter to overlook these items when the physical signs do not arouse suspicion. Again, the large majority of men while in training and under canvass show a marked improvement in their general health, and it is not until they are at the front and have been through one or two winter campaigns in the trenches that their powers of resistance are taxed to the utmost and the trouble makes itself manifest. Pneumonia and pleurisy are easily contracted, and with the lowered resistance brought on by privation and exposure we may look for a large number of these cases before the end of the war.

In dealing with the *Mental* condition we may again divide this subdivision into two classes; there are those that are classified as "shell shocked" and this term covers a very wide field; then again there are the insane. I am of the opinion that many of the insane would have stopped at the stage of "shell shock" were it not for the determination of the men to "carry on" until they fall victims of complete nerve-exhaustion or actually reach the stage of insanity. In the "shell shock" cases loss of memory is a prominent feature which, however, shows satisfactory improvement under favourable conditions. The same may be said of the insane, only in this instance the period of convalescence is longer; such recoveries as have occurred in these shock cases are recent, but it is very doubtful if any of the patients in the two classes just mentioned would be considered fit to be taken on again for overseas service.

The *Rheumatic* conditions generally make their presence known after a few weeks in the training camps, in this instance I refer to both types, feigned and real. The percentage of returned men thus far suffering from rheumatism has been comparatively small.

The *Surgical* conditions constitute the major portion of the disabilities of the returned soldiers. The character of these wounds has been changed from time to time, as is noted for example by comparing the number of shrapnel and gunshot wounds of the skull six months ago, and at present. This again is in all probability due to the wearing of metal helmets by the men in the first lines of trenches. These cases do well, and it is to the credit of those who first handle these men in the dressing stations and clearing hospitals that the primary infection is not fatal. Too much praise cannot be given to them when one stops to consider the many difficulties under which they are carrying on their work. Practically all the wounds are healed when the man arrives in Canada and practically all are infected when they fall into the hands of the medical officer in the field.

The explosive and reversed bullet were very popular with the German until he began to receive them.

It is the wounds of the face and extremities that offer the largest fields for reconstructive surgery. I shall not attempt to enumerate the many original and skilful bits of repair work that have been done especially by the French, but will deal chiefly with the deformties as they exist and the means that are being used to combat them. This brings us to the system of Remedial Exercises which is being carried out in all the hospitals, both in Europe and in Canada. One of the most useful pieces of apparatus is what is known as the *wall rack* which consists of a wooden frame divided into three sections firmly bolted to the wall, which will accommodate three men; the men are placed in this frame where contracted and atrophied muscles can be stretched and developed. The exercises can be made as light or as strenuous as the case requires. Not a few men have been returned to active service, while others have been taken into what is known as the special service battalion, where they can do clerical or other light work thereby releasing men who are fit to go to the front. The results as a whole have been encouraging and much more may be looked for from this system in the future. About six months ago it was known that Germany was returning from 85 to 92 per cent. of her wounded to service, while the English and Canadians were returning from 15 to 18 per cent. This led to the adoption of a gradual system of physical training of the returned men, whereby a large number of what were before useless men from the physical standpoint are now able to "carry on". From the present indications it would appear that outside of the men who are minus an arm or leg, the largest percentage of casualties who will be able to reënlist will be those who have suffered from surgical conditions as compared to the gassed patients.

In the treatment of wounds medical gymnastics is very useful:

1. In preventing the formation of the scar interfering with the function of the limb, as well as in avoiding the stiffness in the joints of the wounded member.
2. In maintaining the muscular system of the region.
3. In preventing the fixation of a nerve in the scar. In case this has been freed by surgical intervention it is necessary that medical gymnastics be applied with the shortest possible delay.

Motor reëducation, that is to say the reëducation of the muscles and of the segments to their normal action, medical gymnastics adopts itself perfectly to the needs and to the capacity of the individual. Day by day it can be modified and adapted to all phases of reëducation. The moral and physical influences springing from the suggestion created by the movement are themselves a great influence in these cases. Medical gymnastics can in effect frequently restore to the patient confidence in himself and his forces.

We now come to the subject of *Vocational Training* and we at once realize that the future of the wounded depends upon the direction of the activities of the man towards some particular trade. Too great care cannot be taken in this regard and one cannot be guided alone by the man's previous experience, but by his physical and mental capacities. His general psychic condition will determine the diminution of his former personal value which is the result, often unsuspected, of the wound. Very exact information of this initial condition of the invalided soldier, and his probable degree of improvement, is due alike to him and his employer.

As a general rule it will be the purpose of the Vocational Department of the Military Hospitals Commission to extend the man's knowledge of his trade to a higher state of preparation, adding to his practical knowledge enough of the theoretical to make him more valuable in his particular line of endeavour; others again must be taught a trade where before they were unskilled labourers.

The problem confronting the Survey Board who pass upon the condition for reëducation is a heavy one and the responsibility is great, for not only do they find it difficult to persuade the prospective student to take up the line of work they find him best fitted to perform, but too often we are confronted with the inclination of the man to cast aside all opportunities for reëducation to accept some "job" with no assurance of its being permanent when all it has to recommend it is the fact it "pays good money".

Our problem of mobilization has been a large one in this great and devastating war—and it is not yet finished—and yet before the end is even in sight we are confronted with even a greater one, that of demobilization. The vastness of the latter is only just beginning to dawn upon us, but when we realize as did Dr. Mewburn when he said in one of his letters: "We will win this war—but our sorrows will be great and most of our male population will be cripples," we begin to see that the time when we can again feel that we are once more back where we were prior to August, 1914, lies far in the future.

THE TREATMENT OF SYPHILIS

Its Effect upon the Wassermann Test using High Dilutions of Serum. A Preliminary Note

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THERE has appeared during the past few years a great mass of literature dealing with the treatment of syphilis, and its effect upon the Wassermann reaction. Generally speaking, it is now conceded that the progress of the treatment is gauged most accurately by the complement fixation test, and a cure is not claimed until the test has been consistently negative for some time, without treatment. So far as those points are concerned, the question may almost be considered a closed one, and yet I propose to read this paper without making any apology for seemingly treading such a well-beaten path. My reasons for bringing this subject to your attention to-night are mainly three: First, the alarming prevalence of the disease; secondly, the necessity of keeping well before us what is already known concerning the treatment; thirdly, the fact that many physicians become very pessimistic regarding treatment after receiving several reports from the laboratory indicating no change in the Wassermann reaction after prolonged treatment.

With regard to the first point, let me briefly call to your attention a few figures to substantiate my statement. Twelve per cent. of all patients coming into the Toronto General Hospital, from any cause whatsoever, have syphilis! In our Outdoor Department the figures are considerably larger, but unfortunately it is not possible to get a routine Wassermann there. We took 779 Wassermann tests in the Outdoor in the year December 13th, 1915, to December 13th, 1916, and of this number 327, or 42 per cent., were positive. When you consider that those figures are taken from the first year of the existence of our Syphilis Clinic, or "Special Treatment Clinic", as we call it, and when you realize that the people

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are just beginning to find their way to this clinic in large numbers, you can form some estimate of the prevalence of syphilis in Toronto. And the majority of these cases are not suspected! That has been our experience, and it is the experience of investigators in Boston.* The latter do not give definite figures covering all types of cases, but we have found that 66 per cent. of all our cases of syphilis in the wards of the hospital were not suspected of having this disease.

With regard to the third point, the following remarks will make clear our object. Many cases of syphilis respond readily to treatment, the symptoms clear up, the Wassermann test becomes negative, and the patient probably is cured. There are a great number, however, which do not show any change in the Wassermann reaction, or do so only after a very long and vigorous course of treatment. For some time past I have felt that we should know what is going on in these cases during this period of treatment. It seemed to me that were we to make a more delicate test of their serums we might detect a change, even in these apparently intractable cases. In examining the literature we found no report of such work having been done. Craig† made dilutions of serum down to 0·02 c.c., in untreated cases, every day for a week, and found that the strength of the reaction varied slightly from day to day, but in the main his results showed that with repeated Wassermann tests, the variations are negligible save in cases which apparently did not have a very strongly positive test at any time. Such instances in untreated syphilis are, in our experience, very rare. It is quite probable that his variations were largely due to differences in the antigen, or as suggested by Haller‡ to variations in the hæmolytic system. The latter author's findings are remarkably constant. Recently King¶ reported results of the quantitative test after treating with salvarsan. In this communication he concludes that little change occurs in the strength of the Wassermann reaction during the first five days following the administration. He also makes the rather general statement that "some previously untreated cases may be given prolonged salvarsan therapy with very little weakening of the Wassermann reaction", though he adds, that they may show striking improvement clincally. We shall take occasion to discuss these statements after presenting our experiments and exhibiting our charts.

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* Walker, J. C., and Haller, D. A. "Routine Wassermann Examination of Four Thousand Hospital Patients". *Jour. Am. Med. Assoc.*, Feb. 12th, 1916.

Stoll, H. F. "The Syphilis We See but Do Not Recognize," *Boston Med. and Surg. Jour.*, 1915, clxxiii, 608.

† Craig, C. F. "Variations in the Strength of the Wassermann Reaction in Untreated Syphilis," *Jour. Amer. Med. Assoc.*, April, 1914.

‡ Haller, D. A. "Variations in the Strength of Positive Wassermann Reactions in Cases of Untreated Syphilis," *Jour. Amer. Med. Assoc.*, March 18th, 1916.

¶ King, Jno. I., Jr. "The Quantitative Effect of Salvarsan on the Wassermann Reaction of the Blood." *Jour. Amer. Med. Assoc.*, December 2nd, 1916.

Technique. In our laboratory, we use a cholesterinized heart antigen and an anti-sheep hæmolytic system Ordinarily we make three dilutions of the patient's serum—0·2 c.c., 0·1 c.c. and 0·05 c.c. This give sufficient information for the regular routine test. Many laboratories use only one dilution—0·1 c.c. For the purposes of this investigation we chose new cases, i.e., cases that had never before been treated for syphilis, and we took them in order as they came to the Out-Patient Department. The number is small, considering the size of our Clinic, and the fact that they extend over a period of three months, but many factors come in to disturb an otherwise ideal field. For example, many cases have previously received desultory treatment in time past. Many leave town before the investigation is completed. Others find their clinical symptoms clear up, and then, despite the warning of the physician that the disease is not yet eradicated and the visits of the social service workers in an endeavour to keep them interested in their own cases, fail to return. The Wassermann test is done before any treatment is begun, and then, with few exceptions, every time the patient returns for treatment (every week if circumstances permit) a sample is taken just before the treatment is administered. The same antigen is used throughout the series. The serum in all cases is diluted so that the small amounts to be used may be accurately measured. Seven tubes, besides the serum control, are used for each case, and they contain 0·2 c.c., 0·1 c.c., 0·05 c.c., 0·025 c.c., 0·01 c.c., 0·005 c.c. and 0·0025 c.c. of the patient's serum. The control tube contains 0·4 c.c.

It may be well, at this point, to describe briefly our method of recording results, as it differs from any we have yet seen. The result in each tube in the test is represented by a number. The figure 4 means that no hæmolysis has occurred in that particular tube; 2 means 50 per cent. hæmolysis; 1 would be 75 per cent. hæmolysis, and 0 would be complete hæmolysis. For example, in our routine Wassermann tests, 444 means no hæmolysis with 0·2 c.c., 0·1 c.c., or 0·05 c.c. serum. Naturally, when a case begins to show the effect of treatment, it is the third tube which goes first since it has the smallest quantity of serum. In this investigation there are seven figures, which indicate exactly what the technician sees in each tube, so that by this method the reader can gain almost as vivid a picture of the result of a test as the one who performs it.

Results. At this early date, our results are necessarily far from complete, but sufficient information is at hand to prove of interest and profit to the man who treats this disease. There are thirty cases in the series. Of these three are congenital; six are in the primary stage, eight in the secondary stage, eleven tertiary* and two were latent. Of the thirty cases, ten have become negative. Of these, two were congenital, three primary, two secondary, two tertiary, while one was a case of latent syphilis. The average amount of treatment required to produce these negative Wassermanns was 4·5 doses averaging 0·5 grams of diarsenol. Of the remainder, seventeen have definitely improved from a serological standpoint, leaving three cases unimproved. One of these cases is tertiary, one G.P.I., and the other latent, and two of these have only had two doses of diarsenol. Other experiments are in progress with other forms of treatment, as mercury, etc.

It is impossible to compare our results with those of other investigators because of the lack of parallel experiments. King probably comes the nearest to our field of work, but he observed his cases over a very short period of time,—five days. He concludes that very little change occurs in the strength of the Wassermann test as the result of a dose of salvarsan. In looking over his protocols we find that three cases out of twenty show a definite weakening in the test, and while our series show a larger percentage than this, we agree to a certain extent with his contention that it takes more than one dose to produce a marked effect upon the complement fixing substances. It was a serious mistake at the beginning of salvarsan therapy, to assert that one dose, or at most two, would be sufficient to cure. It is not surprising to find the laity reluctant to discard this hope, in view of the fact that the symptoms and lesions often clear up very rapidly, but that many of the profession should also be slow to acknowledge its fallacy is indeed a matter for concern, for it is surprising how many still treat syphilis without calling in the aid of the laboratory to check up the progress of the case.

Among the cases which do not respond to treatment general paresis seems to be practically intractable. Such a case is illustrated

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Owing to the lack of a clear line of demarcation between the different stages of syphilis, the above classification is necessarily arbitrary and only approximate. Primary means the presence of a chancre, secondary, the presence of rashy sore throat, mucous patches, condylomata, etc. Tertiary indicates the presence of gummata, vascular changes, etc.

in table H. H., although treatment will be much more prolonged before the experiment is considered complete. For the other types of cases, this short series seems to furnish a definitely favourable result.

The charts are shown with the view of impressing upon our minds the optimistic outlook in treating syphilis. What we wish specially to bring out is the fact that in nearly every case, long before the ordinary Wassermann test shows any sign of being affected by the treatment, the more delicate titration of the serum herein described gives unquestionable evidence of benefit. This is well shown in even this small series and when this research is completed, we hope to have conclusive proof that even in so-called refractory cases, serological changes in the blood will show improvement in at least the higher dilutions. We would therefore make an earnest plea for persistence and optimism in obstinate cases, feeling sure that in nearly every case improvement, sufficiently definite to be reliably measured in the laboratory, will be the outcome.

Conclusions

1. The serological improvement in the blood of cases of syphilis is often not indicated in the ordinary Wassermann test.

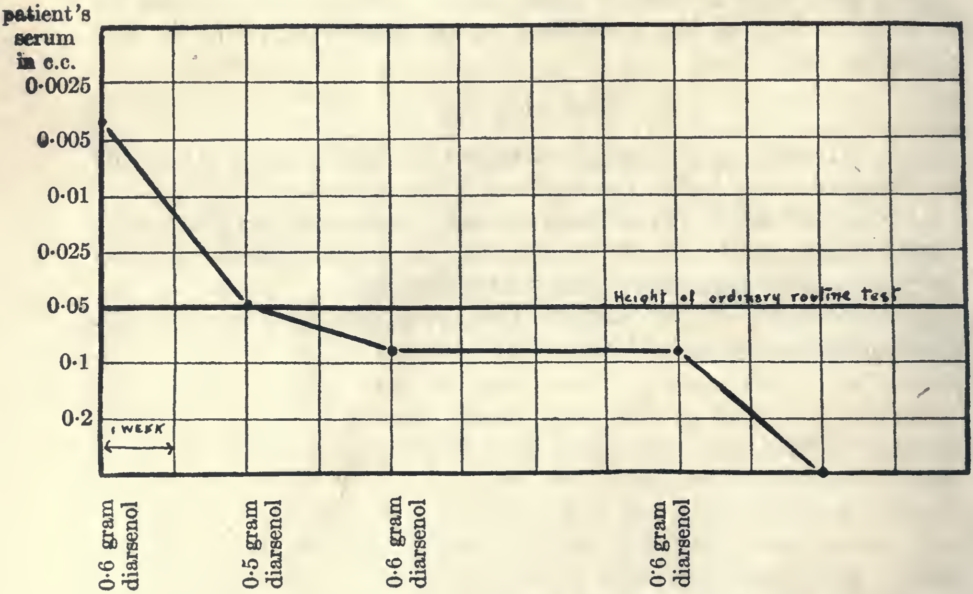
2. By titrating the serums as described under "Technique", such cases, in practically every instance, can be shown to have definitely improved, often after only one injection

3. These findings constitute a strong justification for persistence in treatment of so-called "refractory" cases.

Case A. M.—7185. *Table I.—Secondary.

		Wassermann test						
Nov. 23	No treatment...	4	4	4	4	4	1	0
Nov. 30	·3 gr. diarsenol	4	4	4	4	0	0	0
Dec. 7	2-·3 gr. diarsenol	4	4	4	2	0	0	0
Dec. 14	3-·3 gr. diarsenol	4	4	0	0	0	0	0
Jan. 4		0	0	0	0	0	0	0

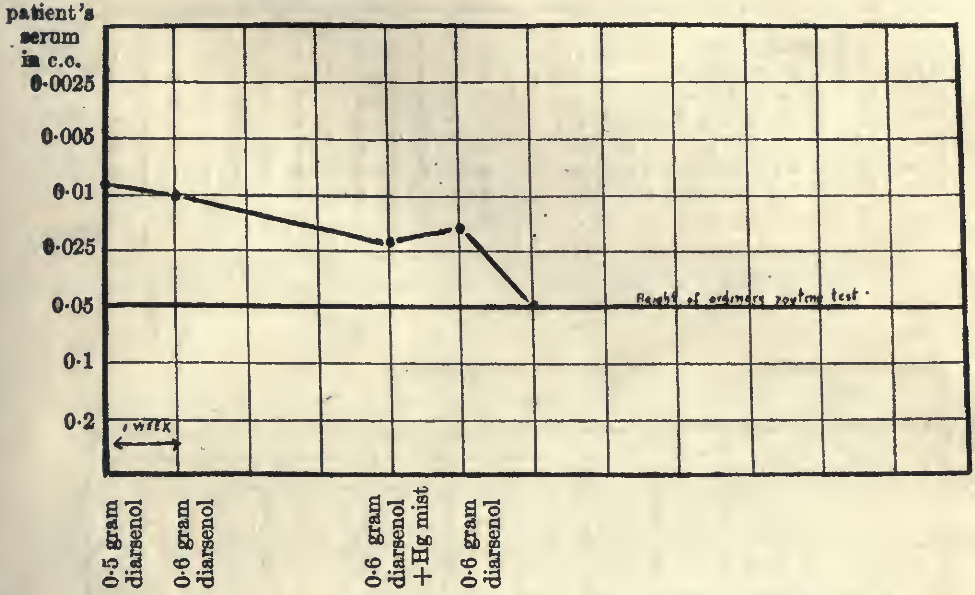
Case M. K.—6829 Table II.—Secondary



		Wassermann test						
Oct. 5	No treatment	4	4	4	4	4	2	1
Oct. 16	·6 diarsenol	4	4	4	0	0	0	0
Oct. 27	1-·6 gr. + ·5 gr. diarsenol	1	1	1	0	0	0	0
Nov. 30	2-·6 gr. + ·5 gr. diarsenol	1	1	1	0	0	0	0
Dec. 13	3-·6 gr. + ·5 gr. diarsenol	0	0	0	0	0	0	0

*Tables indicate *total* treatment up to date mentioned in each case.

CASE E. G.—7238 TABLE III.—TERTIARY



		Wassermann test						
Nov. 10	No treatment...............	4	4	4	4	4	1	0
Nov. 18	·5 gr. diarsenol..............	4	4	4	4	3	1	0
Dec. 5	·5 gr. + ·6 gr. diarsenol......	4	4	4	3	1	0	0
Dec. 11	·5 gr. + 2-·6 gr. diarsenol (Mercury mist.)	4	4	4	4	2	0	0
Dec. 20	·5 gr. + 3-·6 gr. diarsenol (Mercury mist.)	4	4	4	0	0	0	0

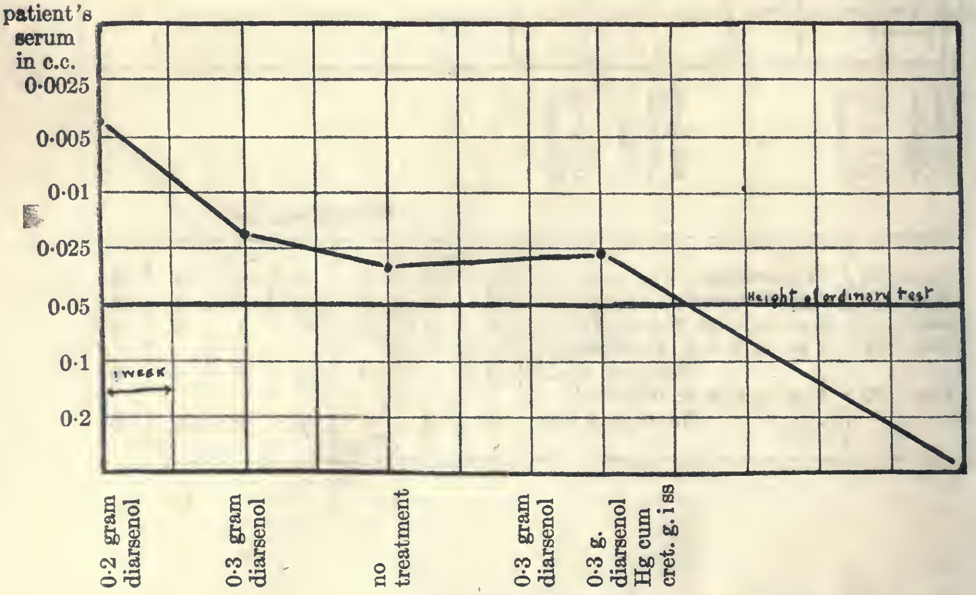
CASE E. B.—6796 TABLE IV.—TERTIARY.

		Wassermann test						
Sep. 28	No treatment...............	4	4	4	4	3	2	1
Oct. 7	1 diarsenol ·3 g.............	4	4	4	4	2	1	0
Oct. 13	1 dose ·3 g. 1 cose ·6 g.......	4	4	4	2	1	0	0
Oct. 25	1 dose ·3 g. 2 doses ·6 g......	0	0	0	0	0	0	0
Nov. 29	....	0	0	0	0	0	0	0

CASE H. H. TABLE V.—GENERAL PARESIS

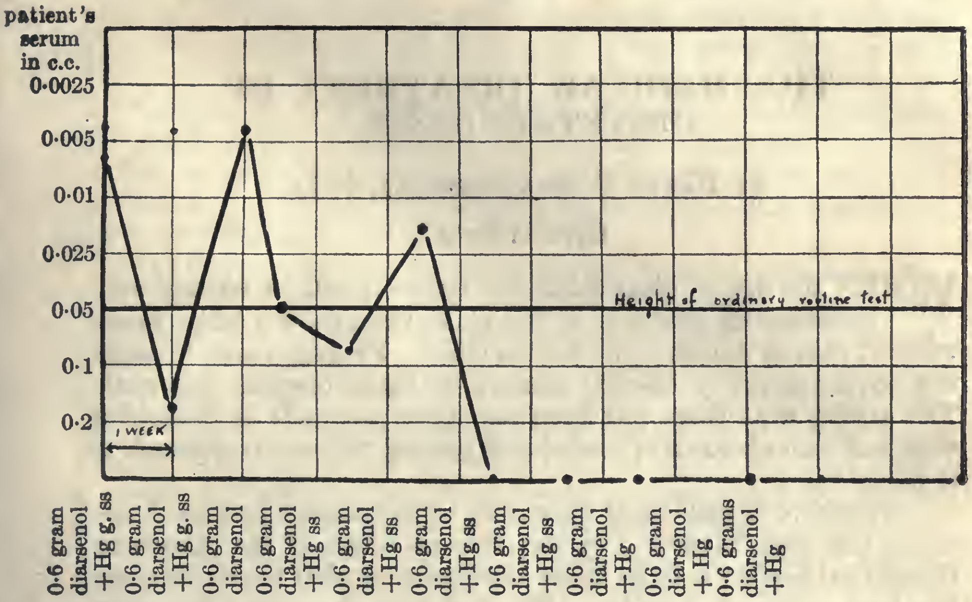
		Wasserman test						
Nov. 2	No treatment...............	4	4	4	4	4	0	0
Nov. 9	·3 gr. diarsenol..............	4	4	4	4	1	0	0
Nov. 14	·3 ·6 g. diarsenol...........	4	4	4	4	3	0	0
Nov. 27	·3 g. 2-·6 g. diarsenol.......	4	4	4	4	4	1	0
Nov. 30	·3 g. 2-·6 g. i ss gr. Hg.....	4	4	4	4	2	0	0
Dec. 5	2-·3 g. 2-·6 gr.; 3 gr. Hg.....	4	4	4	4	4	1	0
Dec. 11	2-·3 g. 3-·6 gr.; 4 gr. Hg.....	4	4	4	4	1	0	0
Jan. 2	....	4	4	4	4	1	0	0

CASE E. M.—6778 TABLE VI.—CONGENITAL



		Wassermann test						
Sep 20	No treatment...............	4	4	4	4	4	2	1
Oct. 5	1 diarsenol ·2 grams........	4	4	4	4	1	0	0
Oct. 23	1-·2 g. 1-·3 g. diarsenol......	4	4	4	3	0	0	0
Nov. 10	1-·2 g. 1-·3 g. diarsenol......	4	4	4	4	0	0	0
Déc. 18	1-·2 g. 3-·3 g. diarsenol Hg, Cret. gr. i ss............	0	0	0	0	0	0	0

Case L. O.—6746 Table VII.—Primary



		Wassermann test						
Sept. 18	No treatment..............	4	4	4	4	2	1	0
Sept. 23	1 diarsenol ·6 g. Hg. gr. ss...	1	1	0	0	0	0	0
Sept. 28	2-·6 g. diarsenol Hg. gr. i....	4	4	4	4	4	3	1
Oct. 1	3rd. ·6 g. diarsenol..........	4	4	4	0	0	0	0
Oct. 7	4th. ·6 g. diarsenol Hg. gr. i ss	2	1	1	0	0	0	0
Oct. 18	5-·6 g. diarsenol Hg. gr. ii	4	4	4	3	2	0	0
Oct. 19	6-·6 g. diarsenol Hg. gr. ii ss...	0	0	0	0	0	0	0
Oct. 26	7-·6 g. diarsenol Hg. gr. ii ss..	0	0	0	0	0	0	0
Nov. 8	8-·6 g. diarsenol Hg. gr. v ss...	0	0	0	0	0	0	0

THE MEDICAL TREATMENT OF OBSTETRIC CASES

By Harry C. Swartzlander, M.D.

Oyen, Alberta

WHEN the day of ideal childbirth comes it will be natural and spontaneous delivery of the child through the birth canal without pain or danger to mother or child. Progress made towards the advancement of obstetrics must be made towards this goal. The saying that there has been less progress made in obstetrics than any other branch of medicine is getting time-worn although it is likely true.

Therefore it may be of benefit to us to consider just what advance has been made. The last two meetings of the American Obstetrical Society may be taken as portraying what recent progress has been made in America. We find that they were taken up largely with papers and discussions of maternity hospitals, licensing nurses and the preparation and qualifications of the graduate for this work: in other words, securing ideal conditions for handling this work rather than any progress in the technique or treatment of the cases. Little is or can be said of progress in the management of labour. Our fathers made their diagnoses and managed their cases as well as we do to-day and with as good results except for the use of a few of the drug preparations of recent discovery. It is in these preparations that the entire progress of recent years has been made.

Considering the drugs that are of value to us in this work we find that they practically all fall under two heads: analgesics and oxytoxics—or pain relievers and pain producers—the latter, of course, an undesirable result of our efforts to force dilatation, extraction, and contraction; dilatation of the os, and the dilatation of the canal and the external parts, an area so extensive that general measures are necessary if any relief be obtained. Scopolamine-morphine is the most promising analgesic so far produced and it is to be hoped that further progress will make it of practical use. So

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far, after a thorough trial the world over, the trend of opinion is towards discarding its use for general practice, and its use is confined to hospitals where absolute quiet and darkened rooms are a necessary adjunct to the treatment. I will not go into the bad effects of this drug in the present state of our knowledge, except to mention that the fact that it interferes with the action of pituitrin is in itself sufficient to bar its use in country practice. H.M.C. tablets, widely advertised and used, are reported to cause asphyxia in the new-born and, especially in the larger doses, will in some cases interfere with the labour pains.

If I use anything during the first stage I prefer heroin in 1-12th grain doses and find it quite satisfactory. The patient rests and the dilatation continues. It is especially indicated where the patient is nervous or hysterical and where the patient has spent a bad ninth month and is hardly fit to go into labour. The amnesia averages about three hours and an examination at the end of that time reveals the cervix thinned and a variable amount of dilatation, but always a reasonable amount more than before the administration of the heroin. It does not interfere with the action of quinine or pituitrin, but these latter interfere with the amnesia and I do not use it where I am soon going to attempt to increase the labour pains. I have not had occasion to repeat the dose and have seen no cases of asphyxia that were not readily accounted for by a hard labour nor is the percentage of asphyxia higher where it is used. In only one case had I any reason to feel that it interfered with the pains. Twenty grains of chloral hydrate per rectum after two inches of dilatation interfered with the labour pains the only time I employed that drug, and I discarded its use as a result.

This leaves us with the general anæsthetics—ether likely is best; but for general work, often single-handed, the difficulty of giving it and attending the patient at the same time makes chloroform the more popular. Chloroform in small doses is the main standby, especially during the second stage. At best, however, these anæsthetics do not produce analgesia, nor eliminate shock, nor do they tend to improve the condition of the patient after labour. A satisfactory anæsthetic must be more prompt in its action, more complete, and leave less bad after-effects—eliminate the vomiting, shock, and not be dangerous to either mother or child in those doses. Theoretically nitrous oxide seems ideal, and very favourable reports are coming from the east of its use. In reasonable doses it may be safely administered by the nurse or one not familiar with anæsthetics. Where death does occur it comes quickly and without warning, but I have not heard of any mortality when used as it would be in maternity work. In forceps cases or any major work I should prefer chloroform or ether.

This is practically the sum and substance of our analgesics. The remainder of our useful drugs, barring atropine, are the oxytoxics. Of these, three stand out prominently, each for its own indication. For forcing engagements and starting dilatation quinine still holds first place; 25 grains in divided doses will usually in about four hours bring labour to the stage where, if thought advisable, pituitrin may be safely used, and labour terminated. I have been surprised to find, in the last week, that there are many doctors who not only do not use quinine for this indication, but who do not know that quinine is an oxytoxic. Therefore I wish to repeat that as an oxytoxic before the indication for pituitrin quinine stands foremost and that at any time in labour it will force engagement of the head in the pelvis, and moulding of the head better than any other drug. Quinine seems to act as a tonic to the muscle fibres—producing more of a heavy tonic contraction while pituitrin might be called an irritant or excitor of the nerve supply of the muscle cells. While speaking of quinine I wish to mention the indication during the puerpureum. I know several surgeons who use quinine as a routine treatment in all cases where there is any chance of sepsis or infection. It is well to remember this indication after any case where interference is necessary. It certainly is of benefit and indicated wherever there is temperature following labour, for it has the twofold merit of causing contraction of the uterus and of reducing the temperature.

In pituitrin we have the main advance of the last ten years. By pituitrin I mean any preparation of the posterior lobe of the pituitary gland. Its use is general and well understood so that I only need to mention it briefly. I use Parke-Davis' preparation at any time after two inches of dilatation, 1-2 c.c. hypodermically, and have seen no reason why it should not be used this early in those doses. In two distinct cases it was the only thing that would convert inefficient pains into ones forcible enough to cause dilatation. I have used it in about 40 per cent. of my cases. In 5 per cent. the action was not characteristic, and in 5 per cent. the labour had to be terminated by forceps.

I never use ergot till after the third stage. I have seen it used earlier and the pains were expellant to a degree that I do not desire, and considering its tendency to cause an hour-glass contraction I have felt that its use is dangerous before that stage. However, if the pulse is over 80 following the third stage I always give 1 c.c. by hypodermic at once and if there has been any chance of infection I order fluid extract ergot for two days following labour, and quinine for three days following that, if any indication for further treatment exists.

In the discussions of the 1915 meeting of the American Obstetrical Society the following was advanced to induce labour. In the evening a large dose of castor oil is given. The following morning after the movement, quinine is given in 5 gr. doses to 40 or 50 grs. In about four hours examination will reveal firm engagement and a moderate amount of dilatation. Pituitrin is now given in 1-2 c.c. doses every twenty minutes till labour is finished. It was favourably reported and well recommended. Occasionally it seems advisable to force labour to a conclusion and in closing I wish to report such a case.

Case 1. Aged twenty-nine years. Two-para, four miscarriages. Extremely hysterical and hard to handle from the time the menses stopped. Both previous labours lasted over twenty-four hours and were followed by six weeks in bed, the first time from an endometritis and the second from a phlegmnasia. Labour started at ten p.m. Saw her at midnight and left instructions that she receive 1-12th grain heroin at 3 a.m. Saw her at eight and found that the patient had rested well and that dilatation was half completed. Ordered four doses of quinine 5 gr. at twenty minute intervals and at eleven found dilatation complete, and the head half descended. Two doses of pituitrin 1-2 c.c. completed the case before noon and the placenta followed in ten minutes. Presentation was an R.O.A. The patient ran a perfectly normal course except for nervousness and was up on the twelfth day and remained up. She was in labour just fourteen hours. I feel justified in saying that from the character of the pains before the quinine was given, she would have had a tedious labour. The heroin worked beautifully—the amnesia lasting longer than the average—securing for both the patient and myself a good night's rest, and at the same time allowing a reasonable amount of dilatation. In judging the effects of all oxytoxics less progress must be expected in primipara and still less in those over twenty-seven years of age. The reason is obvious.

A SATISFACTORY METHOD OF OBTAINING BLOOD FOR DIAGNOSTIC PURPOSES IN INFANCY, WITH A PRELIMINARY REPORT ON LONGITUDINAL SINUS TRANSFUSION

By Earl Mendum Tarr, M.D.

Superintendent, Children's Memorial Hospital, Montreal

ROUTINE blood examination, especially in hospital practice, has become a more or less universal procedure. The value of the Wassermann test is so definite that few hospital cases presenting a specific clinical picture escape this confirmatory test and the increasing necessity of obtaining sufficient blood from infants for diagnostic purposes has made it necessary for us to discover, if possible, a more satisfactory method.

The difficulty with which an infant's vein is entered, either directly or after cutting down upon it, is apparent, but only those who have met with repeated failure in the attempt to obtain blood *via* this route appreciate fully the difficulty.

The heel-splitting operation has been practised extensively in some institutions but can never become a popular procedure. Quite recently I admitted an infant to the wards of the Infants' Hospital in Boston and transfusion was necessary to save its life. The heel had been split to obtain blood for a Wassermann and all attempts to control the subsequent hæmorrhage were inadequate. I mention the method only to condemn it.

There is a place, however, that is far superior to all others for the purpose of obtaining blood in sufficient quantity for accurate diagnostic work. I refer to the longitudinal sinus. From an anatomic point of view this is quite accessible. The sinus grows gradually larger toward the back of the head and for this reason it is well to puncture the fontanelle as far posteriorly as possible. The fact that the course of the sinus does not vary and that the landmarks are so definite enables one, with a little practice, to ac-

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complish with ease and certainty, that which has heretofore been a difficult and uncertain procedure.

The simplicity of the method is well illustrated in a recent publication.* An ordinary 5 c.c. Luer syringe and a short hypo needle of rather large calibre are boiled for ten minutes. The infant is wrapped in a blanket and the area over the fontanelle is cleansed with soap and water and alcohol. Shaving is not essential.

With the index finger of the free hand the posterior angle of the fontanelle is located. Keeping in the mid-line the needle is introduced as near the angle as possible. On entering the sinus one gets the same definite sensation of being within the lumen of a vessel as one does in piercing the dura in doing lumbar puncture. Gentle and even traction on the plunger will bring forth a steady stream of venous blood.

In September of 1915 Helmholtz of Chicago published his first paper bearing upon this route as the most suitable for intravenous medication. At this time Dunn and Howell of Boston were using the sinus route for intravenous injections and also obtained blood *via* this route for their routine Wassermann tests.

They found this route superior to all others. Many of their cases were moribund on admission and these babies were all given dextrose solution directly into the sinus. The promptness with which most of them responded was marvelous and I think it reasonable to presume that several lives were saved in this manner.

Bearing in mind the negative pressure within the sinus it is the custom always to withdraw blood before injecting anything, in this way making certain that we are actually in.

The connexions used in the ordinary injection of dextrose solution are as follows: a piece of tubing four inches long, a glass window of about two inches, and another piece of tubing three inches long, into the end of which is slipped the butt of the needle.

The connexion which comes with Parke Davis' serum products is very suitable and can be sterilized in toto. At present I am using one of these connexions.

It has been suggested that one is apt to produce considerable trauma by repeated puncture of the vein. I shall dismiss this supposition by stating that in one case in which I entered the sinus twenty-one times during the course of ten days no evidence of trauma was noted at autopsy. In twelve other cases that came to autopsy

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*For plates showing Vincent Tube in use see *"Surgery, Gynæcology and Obstetrics,"* vol. xxiii, No. V., pages 623-624.

the vein was examined very carefully and not the slightest evidence of a puncture was noted. These cases had been punctured from one to ten times and were all examined within three hours after reaching the autopsy room

To date I have entered the sinus 207 times for blood and have been disappointed but three times. Dextrose solutions have been administered sixty-four times in forty-nine infants. Salvarsan and diarsenol have been administered to eight infants under two and to one child twenty-eight months old. Nineteen cases of so-called acidosis in infants under two years were treated with sodium bicarbonate solution intravenously with fifteen recoveries. One child three years old was given, during a period of five days, 980 c.c. of the solution. Case discharged well on the tenth day after admission. In this case the fontanelle was rather cartilaginous and a gold-plated lumbar puncture needle was used.

For blood transfusion the sinus routine makes the technique so simple that it can be successfully carried out in most cases by the surgeon in the private house without any elaborate paraphernalia. Of the various transfusion outfits on the market there seems to me no doubt but that the one devised by Vincent is the most practical. It is simple, inexpensive, and has met all of the requirements that I consider worthy of mention.

From the communication here offered, as a preliminary report, I feel justified in deducting:

1. That this method of obtaining blood is safe, simple and practical.
2. That it can be done in any home or out-door clinic, as well as in a hospital.
3. That very little assistance and paraphernalia are required.
4. That intravenous medication may be attempted by the general practitioner under ordinary circumstances.
5. That blood transfusion *via* the sinus route offers many advantages over other methods and that transfusion should be added as a therapeutic measure in the treatment of many diseases, including hæmorrhagic disease of the new-born, in primary hæmorrhage, and as Fischer has conclusively demonstrated, in the treatment of toxic and septic acute infectious diseases and in marasmic infants.

It is a great pleasure to acknowledge the valuable association of Dr. Charles Hunter Dunn and William W. Howell and Beth Vincent of the Visiting Staff of the Infants' Hospital. To Dr. Joseph I. Grover I am indebted for many courtesies and helpful suggestions.

NEWER VIEWS ON VENTILATION

By A. Fisher, M.D.

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THE object of ventilation is surely to provide a continuous and ample supply of fresh pure air, and to ensure the complete elimination and removal of foul air.

What are the qualities of fresh air? To arrive at an answer to this question we will discuss the qualities of air under the following headings:

1. Its chemistry.
2. Its temperature.
3. Air movements.

1. The study of the CHEMISTRY OF AIR will include a consideration of the following factors:

A. Its chemical composition.
B. The presence of organic matter.
C. The presence of dust and of odours.
D. The humidity.

A. CHEMICAL ELEMENTS. It has always been recognized that the essential element of fresh air is oxygen and we have always been led to believe that foul air was due almost solely to the depletion of the air of its necessary oxygen by the process of respiration, and to the presence of the product of respiration, carbon dioxide, in too great an amount. It is now generally agreed that the oxygen content of the air is not lessened nor the CO_2 content increased in an occupied apartment sufficiently to enter into consideration in the problem of ventilation. This conclusion was first arrived at by Dr. Leonard Hill, F.R.S., the English physiologist. He writes as follows in the *Lancet* of May 10th, 1913:

"It has generally been supposed that all the bad effects of close

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crowded rooms and confined places are due to chemical impurity of the air, that the air is contaminated by the exhalation of human beings, and that it becomes impoverished of oxygen; but if we consider what people complain of, we find that people who are in crowded and confined places never complain that there is too little oxygen or too much carbonic acid in the air. What they always complain of is the heat and want of movement of the air. They say 'How close and warm it is! There is not a breath of air.' 'Let us go out and get cool' is the expression one hears in a ball room. The ladies have fans and they put on the thinnest clothing when attending social functions, etc., all showing that what is felt is not chemical impurity, but some other conditions of the atmosphere which affects the heat loss of the body."

EXCESS OF CARBONIC ACID. "Now a great deal is made of carbonic acid in the air but physiological experiment has conclusively proven that the percentage of carbonic acid in crowded rooms has nothing whatever to do with the cause of discomfort for this simple reason that carbonic acid cannot get into the body. The respiration is so controlled by the breathing centre that the excess of carbonic acid (in the atmosphere) cannot enter into the body and the percentage of carbonic acid in the lungs is always kept the same. It is the percentage in the lungs which controls breathing and if we breathe an atmosphere containing say 1 per cent. of carbonic acid, the only result of breathing that atmosphere is that we breathe a little more deeply. We ventilate our lungs a little more in order to keep the normal percentage of carbonic acid in the lungs and the excess of carbonic acid can never get into the body and can never act as a poison, so that we can dismiss carbonic acid altogether. All that carbonic acid can do is to increase the breathing."

DIMINUTION OF OXYGEN. "As to the question of oxygen in the atmosphere, there again the oxygen in a crowded room is never diminished by more than 1 per cent. The cracks and crannies in a crowded room are always such as to let the outside air in. The diminution of 1 per cent. of oxygen has no physiological effect whatever. That is shown by the fact that when you go up in altitude as in the Alps where there are health resorts 5,000 feet high, you will find a diminished partial pressure or concentration of oxygen in the atmosphere. At all those health resorts there is less oxygen by weight in a litre of air (considerably less) than in the most crowded room. . . . Therefore the chemical state of the atmosphere, as far as regards carbonic acid and as far as regards oxygen has nothing whatever to do with the discomfort which is felt in crowded and confined places and it has nothing whatever to do with the success which results from open air treatment in tuberculosis."

Experiments of the New York State Commission on ventilation nevertheless show the following conclusions in the report:

"The chemical changes in the breathed air of occupied rooms are of comparatively minor importance, but the substances present in such air appear to exert the definite measurable effect, a decrease in the appetite for food. An observation which for the first time offers scientific evidence in favour of fresh air as compared with stagnant air of the same temperature and humidity."

They state that the appetite does not appear to be affected by the introduction of CO_2 in the air supply to the extent of 50 parts in 10,000 parts of air in the experimental chamber.

Appetite and the Chemistry of the Air. In a note from the laboratory of the New York State Commission on Ventilation, Mr. C. E. A. Winslow and Mr. G. T. Palmer report that neither the pulse, blood pressure, body temperature, respiration, nor metabolism is influenced to a measurable degree when human subjects are exposed for long periods to the air of a room in which all the chemical products due to human presence have been allowed to accumulate This was the case in spite of the carbon dioxide present amounting on the average to over 30 parts per 10,000, but the temperature of the inhabited space was kept down by artificial means. In the course of the investigation, however, a new measure of the influence of vitiated air was discovered which seems to indicate that there is, after all, an effect produced upon the body by the chemical constituents of the air of an occupied room. This effect is manifested, it is stated, in a diminished appetite for food. In the view of the authors the results of these experiments appear to warrant the conclusions that there are substances present in the air of an unventilated occupied room (even when its temperature and humidity are controlled) which in some way, diminish the appetite for food.

B. Presence of Organic Matter. Dr. Leonard Hill has tackled this question in such a simple way that there is no doubt about it at all. He takes deep boxes, puts a number of guinea pigs and rats at the bottom and has the lids shut down to such an extent that day and night there is no more than one per cent. of carbonic acid in the boxes. There the animals live every day—they are thoroughly cleaned out and well fed and they live at the bottom of these boxes, breathing in the exhalations of their own breath day after day, and the ventilation is so arranged, as I said, that at least one per cent of carbonic acid (produced by themselves) is in the boxes. These animals do not suffer. They live week after week. They have been in the boxes for months. They beget young under these conditions. Young ones placed in the boxes under the same conditions exhibit no sign of poisoning; the animals live and grow.

Dr. Hill has also a number of control boxes containing guinea pigs, perfectly ventilated. In the cold weather the ones that were living in the closed boxes were warmer and put on more weight than those living in the well ventilated boxes. The latter may be hardier, if that could be tested, but at any rate there is no sign of poisoning. We may therefore dismiss the chemical organic poison theory. The ill effect of a confined atmosphere is not due to excess of carbonic acid nor to want of oxygen and there is no organic poison exhaled breath. Of course, we get other exhalations besides the breath—in crowded rooms—from the skin, alimentary canal and so on. So do the guinea pigs. So long as the atmosphere is not too warm, Leonard Hill found that rats prefer to sleep in a chamber that has three to four per cent. of carbonic acid in it. They will sleep there rather than go out into the cold, but if some wet bread be put in and if the temperature be raised inside, the rats will come outside, they do not like it. They do not like a high wet temperature. When together they natually breathe each other's breath. As Hill says, "Every one of us naturally breathes his own breath—because when we exhale we leave the air tubes, nose and so on, full of exhaled air; at the next inspiration we draw back again. We are always inhaling about one third of the air we exhale—exhaled air is not poisonous as regards other exhalations from the body, they certainly make the air smell and although these smells may have a depressing effect on the nervous system, especially of sensitive people, because the imagination plays a great part and has a profound influence upon humanity, that does not prove that these smells are poisonous."

Smells. People who have to deal with smells that are horrible to other people, such as sewer men, men in soap factories, etc., do not suffer ill health as a result. They become immune to these smells.

Every one of us has experienced a disagreeable and sickening sensation when first entering the compartment of a heated, closed up, Alberta railway car in cold winter, especially when the compartment is filled with the great unwashed travelling immigrants, but if we are seated in the car for a short time we rapidly lose all sense of the disagreeable odour. Bad smells no doubt put one off one's appetite and make one feel depressed and therefore should be gotten rid of, but the way to get rid of smell is not by trying to blow it out by ventilation but by cleaning up the source of it. Hill quotes Pettenkoffer as saying that if there was a dunghill in a room, it was no good trying to blow away the smell by means of ventilation; the right thing to do was to clear out the dunghill. If a room smell it is because the room is not clean, or the bodies of the people or their clothes are not clean. The right thing to do is to clean up the room and the people.

C. Dust. Stagnant dust is bad and moving dust is worse and should of course always be eliminated in any system of ventilation. Dusty air can easily be cleaned of its larger mechanical impurities by the use of air washers and air filters.

D. The Humidity of the Air. As *temperature, movement* and *humidity* are the three important properties of air, the study of the percentage of moisture in the air is of the greatest importance.

Inasmuch as the temperature of the body is regulated by the loss of heat through evaporation of water from the lungs and skin, obviously the humidity of the environment of the body is of no small importance. The term "relative humidity" is used to express the ratio of the moisture actually present in a given space to the maximum amount which this volume can contain at the same temperature. At a temperature of 15° C. (59°F.) and with a relative humidity of 75 per cent.—a high figure—Pettenkoffer and Voit estimated the loss of water by the lungs at 286 grams, and from the skin at from 500 to 1,700 grams daily. This will give some idea of the magnitude of the effects here concerned. If the relative humidity be increased, there will be a hindrance to the escape of water from the body; and when this condition of high relative humidity is combined with a high temperature of the air, the heat is far more oppressive than when the air is dry and allows free evaporation. Conversely, a cold, moist atmosphere may also be distressing.

The complexity of the question of humidity is well exemplified by the statement that very humid air, on the one hand, may prevent the comfortable escape of body heat by evaporation, whereas very dry air, especially when warm, is said to affect the mucous membranes injuriously. It is stated that the air in our houses is too dry in winter, especially in cold weather. An American physicist has called attention to the fact that most of the current household devices for humidifying the air of houses heated by the hot air furnace are entirely inadequate for this purpose. According to his calculations, "a house containing 17,000 cubic feet of space would require, for a relative humidity of 40 per cent. at 70° F., with air already containing 20 per cent. humidity and changed once an hour, about 15 gallons of water a day. Rarely will the familiar water pans of furnaces evaporate more than 2 or 3 gallons daily—hardly enough to raise the humidity 5 per cent."

Professor Ingersoll, of the University of Wisconsin, has rarely found a humidity of less than 20 per cent. in buildings examined by him. Even allowing for moisture furnished by the exhalations of occupants and for such occasional sources as cooking operations, he maintains that "many gallons of water must be evaporated daily in a moderate sized house in cold weather to secure even 40 per cent. humidity." The latter figure is less than that given by medical writers as an ideal value. The relative humidity of outside air not infrequently passes the 80 per cent. level. Ingersoll found that when a humidity of 50 per cent. was produced by special devices, the condensation accompanying this value in cold weather proved unbearable. He concludes that for a temperature of about 70 F., which our heated rooms approach in winter, the ideal indoor humidity for winter in a climate such as that of Wisconsin is from 40 to 45 per cent. Seventy per cent. would mean the atmosphere of a steam laundry. According to Ingersoll, any recommendations of this value are either based on pure theory or else are founded on measurements with older forms of unreliable and inaccurate apparatus. Precisely wherein the hygienic advantages of a relative humidity of even 40 per cent. lie remains to be explained.

A Minneapolis authority writes in the *Journal of the American Medical Association* as follows: "While very humid air prevents the escape of bodily heat by evaporation, it is true that very dry air, especially when warm, may injuriously affect the mucous membranes. The artificial humidification of air in cold climates is doubtless a most desirable part of a ventilating equipment."

In ventilating a room, the temperatures and humidities should approximate those of the climate as nearly as possible. In England 58° temperature with 60 per cent. relative humidity is common in the school; this would be impossible in Alberta in winter.

Winslow, of the New York State Commission, points out that "very dry air in a hospital operating room might promote harmful evaporation from the exposed body cavity—artificial humidification would not only lessen evaporation but would diminish the cooling effect and so make it possible to avoid the extremely high temperatures now generally considered necessary."

2. The Temperature of the Air and Its Effects

Physiologic studies have shown that air temperature and air humidity have profound effects on the human organisms and in hospitals where we are dealing with persons of lowered vitality these effects must be interpreted. "The whole of the bad influence of confined quarters and the good influence of open air is a question of the heat and moisture of the atmosphere."

Cold exerts a baneful and irritating influence upon many of the acute and even chronic respiratory conditions by irritating the mucous membrane lining to upper breathing passages.

The conclusion has been reached that fresh air at a temperature of 50° to 60° F. exerts a most beneficial influence. The inside temperature of living rooms should be about 68–70° F. At a lower temperature its effect is prone to be detrimental.

The artificial humidification of air in cold climates is doubtless a most desirable part of a ventilating equipment.

Dr. James emphasizes the importance of marked alterations in the temperatures of wards as opposed to the uniform temperature at any one level. His belief in the benefit of such alterations is based on general clinical observations and is ascribed to an action on the vasomotor system.

"The room temperature best liked by the average person seems to bear a fixed relation to the outside temperature and vapour condition." The most suitable temperatures with corresponding outside temperatures up to 66° humidity are as follows, according to Ohmes, a New York Ventilating Engineer:

68° outside 68° inside.
75° outside 72° inside.
80° outside 64° inside.
85° outside 76° inside.
90° outside 78° inside.

3. Air Movement.

There is one thing certain that we are not going to get any degree of ventilation without a certain amount of movement in the air. There is no doubt that rapidly moving currents of cool air will increase the loss of heat from the body by convection and by evaporation and this is beneficial provided it is not carried to an extreme degree. The *Journal of the American Medical Association* says "the principle of ventilation by currents is preferable to the principle of ventilation by dilution and smaller volumes of air are sufficient when introduced by currents; convection in the production of currents is effective and economical; upward ventilating currents in crowded rooms are desirable, provided the sources of air supply are free of contamination; the delivery of a certain volume of air per unit of time, per occupant, into a given space does not necessarily constitute ventilation; air introduced into an occupied room in such a way that it strikes the occupants should not be lower in temperature than 60°. If the atmosphere is cool and moving it will continually carry away heat from the skin. It will keep the vessels of the skin contracted; the blood will be driven into the deeper organs where it will be used to build up the body tissues. Moreover the cool moving air acts upon the skin and stimulates the nerves, and the nerves of the skin have a great influence upon our comfort. When we get into confined places the air produces a monotonous uniform temperature of the skin, which organ gets hot, flushed with blood and of a temperature almost the same as that of the body. The sensory nerves are no longer stimulated because there is no change. If, on the other hand the air is continuously moving or blowing, it is continually stimulating the nerve endings of the skin and the nervous system generally and it arouses us to activity, for in order to keep warm we have to use our own body furnace and that is what we ought to do. We do not want to trust to clothes and fires altogether because by that means we are not using the natural body furnace. We do not circulate our blood well, because exercise has a colossal effect upon the circulation. When the muscles are at work, the heart beats more quickly and the blood is carried around the body much more quickly. We breathe more deeply in order to get rid of the carbonic acid and we take in more oxygen, the blood is better oxygenated, the lungs are better expanded and this is an important thing for resisting infection—the expansion and oxygenation of the blood takes place in every part of the lungs. The ventilation of the lungs is increased greatly. Exposure to wind and cold leads to an increased activity in all parts of the body and it is that which has an effect upon tuberculosis."

The velocity of air movement best suited to the requirement of the body is an important question. Although text-books ascribe some eighty diseases directly or indirectly to exposure to cold and draught, these diseases are usually due to bacterial infection. This question will be discussed in the paragraph on draughts.

Draughts and Colds. Up to recent years most hygienists and physicians held draughts in abhorrence but it is certain that many of the colds attributed to draughts are not due to draughts at all. The ordinary man assumes that draughts are the cause of colds and unless he lives in a hermetically sealed case, he can always find a draught of which he can make a scapegoat. Further it is just in close and stuffy rooms—when the skin is *warm* and *moist*—that a draught is most readily perceived and the *cold* or *bronchitis* ascribed to draught in such instances is almost certainly due to an infection from the germs in the polluted atmosphere of the room and has nothing to do with draughts.

For these and other reasons we must hesitate to accept the ordinary statement: "I sat in a draught and caught a cold." And yet a draught may under certain conditions be a most potent factor in the production of a cold.

An authority in physiology gives the following definition of a draught: A draught is a concentrated current of sensibly cold air impinging upon a localized area of the skin and though it is plain that such a current of air cannot directly cause a "cold" which is a disease caused by bacteria, yet is equally plain that it may well be an auxiliary factor; for it may cool the blood which is circulating in the capillaries of the skin area to such a great extent as to diminish the agents in the blood, that normally fight and throw off disease. Again very sudden and rapid cooling of the skin causes the cutaneous blood vessels to close up quickly and become much narrower, thus preventing much blood from circulating through the surface vessels of the body and then in turn preventing a too rapid cooling of the entire mass of blood in the body. As a result of this precautionary measure on the part of nature, there is bound to be overfilling of the blood vessels in the deeper parts of the body with resulting congestion and sometimes inflammation of the organs supplied by this blood." (*British Medical Journal.*)

If the vessels of the skin are trained to react quickly to cold by resorting to the routine morning cold bath or sponge, the blood will not be cooled so rapidly as it otherwise would be. We must admit therefore that draughts may sometimes in this way be a factor in the production of colds, but the great point to note is that they are merely auxiliaries unless they succeed in cooling the blood unduly; and unless certain germs are present they are as a rule quite ineffective.

It is true that if a man lives constantly in a warm moist still atmosphere and if his skin be continually protected from the normal stimulation of cool moving air, the nerves governing the blood vessels of the skin if unexpectedly called upon, may forget their business and respond sluggishly and inadequately to the stimulation of cold, and that heat may then be unduly lost with deleterious results; but the natural well fed, well clothed human being has active ready reflexes (in the form of nerves supplying the muscles of the walls of the blood vessels of the skin) and is not likely to be unduly chilled by draughts.

"Draughts there must be, draughts there should be and it is much easier to train the blood vessel walls to respond to them and thus prevent undue loss of heat, than to try to escape from the draughts altogether." (*British Medical Journal.*)

It is in stuffy, dirty rooms and churches that draughts are most feared; and there is most reason for fear. In sanatoriums where draughts are large and constant and where bacteria are comparatively rare, colds very seldom occur.

In an article in the *British Medical Journal*, 1911, the writer says, "draughts do occasionally play an auxiliary part in the production of colds but they are easily deprived of their danger and they should be favoured rather than feared." He says further, "to endeavour to escape cold by avoiding all draughts must always be futile and foolish policy and will not only defeat its own aim by fostering bacteria and by promoting vasomotor lethargy and incompetence, but will lead to deficient vigour through interference with the skin reflexes which play an important part in the respiratory and circulatory functions. When we wish to excite the heat centre of the new born babe we appeal to its skin reflexes and in case of night sweats in tuberculosis, a breeze on the skin seems to give tone to the whole vasomotor system."

"The skin is certainly meant to be exposed to moving air currents and to changes of heat and cold, it is surely meant to have a blood supply that ebbs and flows according to the thermal need of the tissues, it is surely meant to perspire and to transpire, and accordingly to shut it off from wind currents and to enclose it in a motionless layer of moist air is to depart very far from the ways of physiological righteousness. The bracing effect of dry air and of seaside breezes are largely due to their stimulating effects on the excretory and reflex functions of the skin; and the man who endeavours to avoid colds by avoiding all draughts will not only catch more than his share of colds but will possess much less than his share of health and vigour." (*British Medical Journal.*)

Natural versus Artificial Ventilation in Hospitals. By natural ventilation we mean the entrance of "fresh" air into buildings through open windows and doors. In artificial ventilation the outside air gains admission through ducts or conduits and the entrance into the rooms and wards is affected through registers in the walls. In the case of hospitals situated as ideally as the Calgary General Hospital in a large open park, if we can secure adequate cross window ventilation in the wards, natural ventilation should fulfil every requirement, but even in this institution on account of the occasional occurrence of dust storms, we cannot at all times permit our windows to be open. Further, open window ventilation can never be automatically regulated. In wards this regulation will naturally devolve upon the nurses who cannot always be depended upon to employ the care and intelligence necessary. It must be admitted that a number of persons in any wards are rarely in perfect agreement as to the quality and freshness of the confined air and that particularly in the cold season of this northern climate, whatever the cause, the most glaring disagreements exist. This condition is well known and it makes no difference whether the fresh air enters through an open window or is introduced by artificial means. The opening of windows is not objected to when the inside and outside temperatures are about equal or when the latter is higher. If it is some degrees cooler outside than inside and the cold air enters through the windows it mixes very slowly with the warm room air and it sinks to the floor, thus creating a difference of temperature between floor and height of head and chilling of the patient may take place. In addition excessive draughts are at times created by opening windows on dusty days. But with all possible difficulties that we are able to perceive in window ventilation what are we to think of artificial ventilation?

Artificial Ventilation. As these systems have been installed they have not as a whole been satisfactory, but there is no doubt that hospitals erected in crowded centres can scarcely dispense with artificial methods of ventilation. A writer in the *Modern Hospital* says: "A great deal is said of the success of natural ventilation but it may be questioned whether the exponent of such a method considers the nuisance caused by opened windows because of dust and of noise and the effect of the dry air as well as the difficulty of controlling this method."

There are few who do not believe in the importance of a complete artificial ventilation plant for the operating room, the utility and toilet rooms and the kitchens. In the operating room the air supply register should be provided with some form of efficient antiseptic air filter. The toilets, kitchens and utility rooms must be so ventilated that the foul air from them is taken away directly in flues and does not enter the corridors or wards. The withdrawal of air from these rooms by means of a flue provided with a fan may be so worked that a partial vacuum will be produced and air will then be drawn from the adjacent halls. I believe that ultimately the most perfect ventilation of hospitals will be accomplished by artificial methods. If this method is inefficient period flushing of wards with air from open windows may be necessary.

Dr. Charles White, medical director of the Tuberculosis League Hospital, Pittsburgh, Pennsylania, has been appointed Director of the voluntary relief work of the health service of the French War Department by the Boston Committee for French Relief. Dr. White is the son of Mr. James White of Woodstock, Ontario.

It is stated that up to the end of December, 1916, the casualties among members of the French medical services were 285 killed in action, 453 missing, and 1,350 wounded.

THE ABILITY OF MOTHERS TO NURSE THEIR INFANTS

BY ALAN BROWN, M.B.

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THE present study was undertaken for three reasons. First, the remark made by one of my obstetrical colleagues, that very few of the young women of to-day can nurse, compared with the ability of women twenty or thirty years ago; second, to bring before the practising physician the importance of maternal nursing and how negligent we all are on the insistence of this most vital natural function; thirdly, to endeavour to show the layman the true status of affairs regarding the nursing problem and in this way endeavour to obtain coöperation with their physician in order to prolong the lactation period.

According to Eross, the average mortality, based on figures from thirteen European countries, during the first year of life is 18·33 per cent. The United States census reports give a similar figure. There is, however, as might be expected, considerable variation in different parts of the world. In Ireland it is but 9·4 per cent. and in Sweden 9·7 per cent; in Saxony on the other hand, 28·1 per cent. and in Bavaria 28·7 per cent.; in Russia, according to Gundobin, it is still higher, 32·6 per cent. Budin reports a mortality in the first year for France from 1896 to 1900 of 20·2 per cent.

Every practising physician knows that the greatest number of deaths during the first year is caused by digestive trouble, that this is true is borne out by statistics obtained from all children's clinics throughout the world. In the mortality of Massachusetts from 1892 to 1896 according to Abbott diarrhœal disorders were responsible for 29·49 per cent. of the deaths in the first year of life. Budin found that 38·5 per cent. of the deaths in the first year in the civic population of France were due to gastro-enteritis. Two years ago it was estimated by the author that in six leading cities in the

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Dominion 44·4 per cent. of the infant deaths was caused by digestive troubles, the highest percentage of 57·6 per cent. being in Ottawa.

This brings us naturally to the next point to be considered, the influence of the diet, since it is particularly among the artificially fed infants that gastro-enteric affections prevail. We have reason to expect then that the mortality will be found much greater in the artificially fed. That this is the case is well recognized, but a few figures may serve to illustrate to what degree it is true. In the cases reported by Luling, 14·24 per cent. of the breast fed infants died and 31·42 per cent. to 50·24 per cent. of the bottle fed; and in the 10,000 infants in the first year studied by Westgaard of those that were breast fed 17 per cent. died from gastro-intestinal disease, and of the bottle fed 43 per cent. Of 1,000 infants studied by Armstrong in England but 8·4 per cent. of the breast fed died as against 22·8 per cent. of the bottle fed. Finally W. H. Davies addressed letters of inquiry to a large number of women giving birth to children in 1910 in Boston. The 736 replies showed that only 26 per cent. of the deaths between two weeks and one year of age had occurred in breast fed babies. Roughly speaking, we may say that the breast fed baby has at least five times the chance of living that the bottle fed baby possesses. We may then assume it proved beyond question that the absence of breast feeding is perhaps the chief cause of infant mortality in the first year, as indeed of many deaths occurring in the second year. We may even go further than this and claim that the results of bottle feeding are often much more lasting than this period. Thus Rose studied 164,000 persons with relation to the later influence of the diet which had been given in the first year of life, and found that in many respects the deleterious effects of bottle feeding were often quite discoverable in these individuals, and that even in men capable of military service the difference, to the disadvantage of the bottle fed baby, was very apparent. This observation is by no means an isolated one, similar conditions having been noted by other writers.

With the full understanding of these facts, the importance of the next three topics to which reference must be made is pressed home on us: (1) How many mothers nurse their children? (2) How many are capable of nursing? (3) What is the cause of failure of women to nurse their infants?

The condition varies considerably with the country. In Japan, breast feeding is the rule. In Greenland, artificial feeding is scarcely known, and among the Esquimaux of Alaska there is no cow's milk to be had and infants are often nursed for from two to three years. In some of the races of Africa, the mother is often helped, if need be, by any of the women of the village, previous parturition, recent or otherwise, not being a necessity, the secretion of milk being gradually established in virgins or in grandmothers by the repeated putting of the child to the breast.

The importance of nursing by the mother is one long recognized by writers. An interesting contribution by Schlossmann quotes the urgent advice given in favour of it by the philosopher, Favorinus, who lived in the time of Trajan. Unfortunately, however, in many of the so-called civilized countries, maternal nursing has undoubtedly decreased greatly in frequency since then. In parts of Bavaria, according to Grassl, hardly 30 per cent. of the mothers give the children the breast. In Berlin, as stated by Neumann, 55·2 per cent. of the infants were nursed in 1885 and only 31·4 per cent. in 1890, showing the great falling off which had occurred in maternal nursing.

Is this failure of breast feeding an actual inability or only an apparent one? Is there in reality a diminishing power of women to nurse their infants? As a result of studies in the obstetrical clinic of Graz, Negris found there existed in only 10 per cent. a physical disability to nurse. In the Stuttgart Clinic according to Martin nearly 100 per cent. do nurse. In Heidelberg, Jaschke observed that whereas in 1904, 64·01 per cent. of the infants were breast fed, in 1907 86·14 per cent, and in some months 97·22 per cent., showing a very decided increase in the ability. Madam Dluski estimated that of 500 women observed in Pinard's Clinic in Paris there were but five in whom it was certain that nursing could have been improved either from the beginning of lactation, or after an interval of continuous effort; and Blackner as a result of studies on 1,000 children in London could only find 2·5 per cent. in whom there was a physical inability to nurse.

With regard to the frequency of breast feeding, whether there is an actual diminution or an apparent one only, some of the figures which have been given are to a certain degree open to criticism. In the first place, many of the statistics are derived from Lying-in institutions, for patients of the poorer classes only, among whom the conditions of life are very different from those which are obtained from among the well-to-do. In the second place, such statistics apply only to the first few weeks of the nursing period, during which the women are under close observation and careful diet and treatment, and we have no means of knowing how many of these women are able to continue nursing, say, for six months or more, or do so, even if able, after they return to their homes. The important matter to determine, is whether there is a diminution in the actual ability of women to continue nursing or whether the cessation of nursing is a preventable condition. Exact figures bearing on this are not very numerous and there are none published in Canadian literature.

In every locality where propaganda for reform has been instituted there has been an encouraging increase in the number of nursing mothers. Deneke and Thorn, through the aid of midwives, studied the later history of 32,447 infants born in the Magdeburg district in 1907 outside of maternity institutions. It was found that 83·7 per cent. of these were nursed for at least a time and that in 61 per cent. nursing was continued for longer than two or three months. They conclude from their studies that the great majority of mothers are physically capable of nursing their children. Hegar is of the opinion that under careful management 60 per cent. of mothers outside of maternities are able to nurse their children. Kriege and Seutermann in private practice found that 77·9 per cent. nursed from five to six months. Koplik in 1,000 cases in private practice in New York found less favourable conditions, only 40 per cent. were nursed for longer than four months. Marfan, on the other hand, estimated as in his own private practice that two thirds of the women of Paris can nurse satisfactorily and in the other third there is generally a partial power to do so; only about 10 per cent. are actually unable to do so.

The question then of the falling off of maternal nursing feeding can be determined only partially on account of the variation in published statistics; undoubtedly many more women cannot nurse than should be the case among supposedly normal individuals. It is certain, on the other hand, many women who do not nurse are capable of doing so under proper care.

Schwarz of New York demonstrated the importance of supervision of breast fed infants in 1912. The results of 1,500 cases may be seen from Table 3, where through education and proper social regulations of some 1,500 women he was able to keep 63 per cent. of the babies nursing for a period of nine months. He further observed that many multipara were able to nurse their infants successfully when previously they were unable to do so.

The results of my own observations, extending over a period of two years, upon this subject, are summed up in Tables 1 and 2. The cases being divided into three groups: A, Students and nurses, representative of conditions twenty to thirty years ago; B, Private patients representing middle and upper classes, and C, Clinic cases representing the poor of our city. In all observations were carried out on some 2,079 cases. In Group A the information was obtained through a questionnaire sent to 500 students and nurses requesting them to ascertain whether they were breast fed or not and if so how long. Accurate and reliable information was obtained from 137. In Group B the information was obtained and recorded in my routine private practice and in Group C the information was obtained from the records of the various prophylactic infant clinics scattered throughout the city. From these figures it will be seen that there was approximately 10 per cent. less artificial feeding twenty years ago, that fully 10 per cent. more mothers nursed their infants for three months twenty years ago and that 50 per cent. more nursed them nine months. Another striking feature is the fact that most of the weaning takes place within the first three months which is the period during which the most supervision is essential. Of 250 cases that were weaned in private practice 32 per cent. were weaned purely on account of vomiting or green stools or in other words, excessive feeding. Another interesting feature of these figures is the superiority of the clinic class of mothers over those of the well-to-do.

The effect of intelligent instruction upon the influence of maternal nursing may be noted in Table 2, where it will be seen that in the first four clinics, which were the first established, the percentage of nursing mothers is higher than in the more recently established clinics placed in the newer sections of the city.

Table 3 compares the percentage of nursing mothers among clinic cases with American, foreign and Canadian mothers, and this to my mind is one of the most instructive, for herein should lie our efforts to overcome such a deplorable condition. To my mind there is no excuse and the onus lies first with the physician and nurses and secondly with the women themselves to see that such conditions be remedied for the good of our future citizens.

Some of the statistics of maternities quoted are at best a clear indication of the general change which it is to be hoped is taking place. The clearly increasing number of women in some of these institutions who now nurse their children, as compared with the conditions a few years earlier, indicates that a similar increase of frequency of nursing is to be looked for in patients outside of the institutions. Certain it is among the more intelligent classes and even among the poorer under the influence of the awakened conscience of physicians and the instruction which mothers receive from the various sources, there is a growing earnest desire of women to nurse their children, and it would seem an increasing frequency of maternal nursing.

This brings us to our last question. What is the cause of the diminution of breast feeding which has shown itself in many regions? Beeng believes that there is an increasing actual physical disability of the mothers to carry on maternal feeding, which he attributes largely to the continual use of alcohol by civilized races. Whatever the cause, there is good reason to believe that there is a physical disability to a certain extent and that this disability may be transmitted by inheritance. Most investigators, however, think that the cause of failure to nurse is to be sought rather in the unwillingness of the mother instigated or abetted often by the advice of nurses and physicians. Hegar expresses this clearly in attributing the inability to nurse to the influence of generations of undervaluing of maternal feeding. The introduction of the numerous methods of artificial feeding led easily to the conviction that nursing at the breast was unnecessary and an onerous affair. Ziegenspeck points out that in Germany, where the preparation of artificial foods and food mixtures has long thriven, dating, as we know, at least from the time of Melhinger, maternal nursing has suffered proportionately.

Among the working classes, undoubtedly poverty is a frequent cause of the desire to avoid nursing. It is often imperative for the mother to work, and she cannot well do this and attend to the infant also. In other cases lack of suitable nourishment for the mother causes a failure in the secretion of milk. The remedies for these difficulties are to be found only in sociologic aid. In other cases it is the complete ignorance of the mothers regarding the importance of breast feeding which leads to gross indifference in the mother and this applies to all classes of society. Only constant instruction of the people can remedy this. The splendid work of the Consultations de Nourissons founded in Paris and the similar prophylactic baby clinics scattered throughout this city and the many cities throughout the States has by this instruction increased maternal nursing and generally emphasized the importance of the hygiene and feeding of the infant. In the upper classes there is undoubtedly often seen an inability to nurse dependent on the more highly organized and hence more easily disturbed nervous organization of the mother. Here, too, is the influence of early mental forcing, early enjoyment of social life, with late hours and the like. Faulty methods of dressing have doubtless in the past been the cause of many hopelessly depressed nipples.

The numerous stated contra-indications to nursing are more fancied than real; actual contra-indications are few, and physicians should learn to appreciate this fact. Here, especially, the obstetrician who is thoroughly grounded in the importance of breast feeding can be of the greatest assistance since he is so early associated with the mother and can exert a great influence over her. Certainly many obstetricians in the past have paid all needed attention to the mother, but far too little to the infants. This is a reproach often made, but one which I hope is passing away. There can be no good substitute for mother's milk and this the obstetrician should impress on the mother with all his power.

Finally in this connexion, it must never be forgotten that inability to nurse or inability on the part of the infant to digest its mother's milk can never be determined by a brief trial. It is only after a prolonged and repeated and again repeated efforts that we can reasonably conclude that weaning is necessary. Here the fault lies with the physician, since they are, as a rule, far too ready to abandon their efforts. The mother is perhaps clamorous for weaning, and it is easy to move in the path of least resistance. Many a time the breast which at first gives insufficient milk, will later render an abundant supply, and the infant's digestion, at first much disturbed, will accustom itself perfectly after a while.

In conclusion I think it may be claimed:

1. That Canadian mothers nurse their infants less than do either American or foreign born women.

2. That the well to do of this city and environs nurse their infants less than do those of the poorer classes.

3. That maternal nursing is less to-day than it was twenty or thirty years ago in Canada, but in view of recent enlightenment is certainly on the increase.

4. That the infrequency of nursing depends chiefly on the ignorance of the laity and the indifference of the physician. It is our duty as physicians to remedy these evils.

In conclusion I wish to express my indebtedness to Dr. K. C. McKilwraith for suggesting the subject, and to Doctors Smith, Mitchell, McBroom, Ogden, Morrison, Hume, Davis, Bond, Fotheringham and Tisdale for assistance in collecting the figures from their respective infant clinics, and last but not least to the public health nurses of this city through whose efforts this study has been made possible.

TABLE I.

	Number of cases	Per cent. Artificially fed from birth *	Per cent. Nursing up to 3 months †	Per cent. Nursing up to 6 months ‡	Per cent. Nursing up to 9 months §	Per cent. Nursing over 9 months
Students and nurses. .	137	12·4	87·6	84·7	76·6	29·9
Private patients.	633	24·0	76·3	46·7	30·4	9·8
Clinic cases.	946	16·53	79·65	60·51	31·88	. . .

* Approximately 10 per cent. less artificial feeding twenty years ago.
† Approximately 10 per cent. more nursing twenty years ago.
‡ Approximately 30 per cent. more nursing twenty years ago.
§ Approximately 50 per cent. more nursing twenty years ago.

Present day nursing figures in comparison with those of over twenty years ago. Of 250 cases weaned in private practise, 32 per cent. were weaned on account of dyspeptic symptoms and the remainder did not have enough.

TABLE II.

NURSING STATISTICS FROM THE VARIOUS DISTRICTS IN TORONTO

	No. of cases	Per cent. nursing 1 to 3 mos.	Per cent. nursing 3 to 6 mos.	Per cent. nursing 6 to 9 mos.	Artificially fed from birth
1. Down Town.	175	93·7	65·7	48·0	6·2
2. Central Toronto.	41	90·2	75·6	39·0	9·7
3. West Toronto.	171	81·2	67·1	52·6	18·7
4. East Toronto.	45	93·3	53·3	43·3	6·6
5. West Central.	178	74·4	54·5	41·5	25·5
6. North Toronto.	136	76·4	50·7	38·9	16·1
7. North West.	45	75·5	55·5	33·3	24·4
8. Central Toronto.	16	75·0	75·0	18·7	25·0
9. West Central.	114	86·8	51·7	17·5	13·1
10. North Toronto.	25	80·0	36·0	16·0	20·0

TABLE III.

Comparison of Breast Feeding Results in American-Born, Foreign-Born and Canadian-Born Women

Breast feeding	American Mothers Percentage	Foreign Mothers Percentage	Canadian Mothers Percentage
One to three months.........	83	88·1	79·6
Three to six months.........	63	77	60·5
Six to nine months..........	63	70·3	31·8

A case was recently brought by the Alberta Medical Association against Jean Louis Gillier for practising medicine without a license. The defendant had opened a hydro-physiotherapic institute at Athabasca where he gave a certain treatment which he described as an "absolute treatment, being the application of cold and heat, which permeates the skin, restores the circulation, and removes the morbid condition of the body." He stated that he was born in France, had graduated from the Paris Academy, and had been duly registered as a practitioner in France, England, Russia, and the United States. He was fined $20 and costs.

Editorial

RETURNED INVALID SOLDIERS

INFORMATION has reached us just as we are going to press, that as a result of a conference between the Minister of Militia and the Army Medical Service on the one side, and Sir James Lougheed and the Military Hospitals Commission on the other, it has been agreed that in future, medical control of the returned invalid soldier shall be wholly in the hands of the Army Medical Corps, while the provision and maintenance of the necessary Hospitals, Convalescent Homes, and Institutions for special orders of cases together with physical training and reëducation of the convalescents shall remain in the hands of the Military Hospitals Commission. We are heartily glad that at last this agreement has been reached: from the point of view of the Medical profession it is the only possible arrangement.

We can well understand and sympathize with the movement which led to the establishment of the Hospitals Commission. In the summer of 1915 the greater number of the officers of the Permanent Army Medical Corps had of necessity gone overseas together with the greater number of the old and experienced members of the Army Medical Service connected with the Active Militia. The Acting Director-General of Medical Services, and those left behind to undertake the medical administration of the different districts, were too few in number, and too busily occupied with their clerical and other duties to take up with any prospect of success, the heavy work of establishing military hospitals and convalescent homes for returned invalids in the different districts. Indeed, at that period what was needed was not the provision of hospitals for active treatment so much as of convalescent homes. What was needed for this purpose was a body of representative men well known in the different provinces, each of whom might stimulate the provincial and municipal bodies in his district or province to coöperate with the Government in obtaining the necessary accommodation and equipment. As a matter of fact, the Military Hospitals Commission has accomplished notable work in this particular direction, although they still have much to accomplish. There was a general understanding that the Army Medical Corps would be responsible for the care and treatment of men in the Expeditionary Force who had not left Canada, whereas the Military Hospitals Commission would be responsible for the care and treatment of the men of the Canadian Expeditionary Force who had returned from service overseas. So long as the returned soldiers were of the convalescent class this understanding worked well. With the great number of casualties in the British Expeditionary Force during the latter part of last year, and in addition the possible need of emptying the British Hospitals in anticipation of a Spring campaign, the inherent difficulties of the understanding have made themselves felt more and more acutely, as during the last few weeks more and more men have returned to Canada who need active hospital treatment.

For the Military Hospitals Commission to undertake the active treatment of men returning to Canada without their treatment having reached finality, there was forthwith established the need for the development in each district of a double service. Now with some 1,300 Canadian medical men overseas with the Canadian Expeditionary Force, and another 400 medical men overseas with the Royal Army Medical Corps, it has been difficult enough to get an adequate supply of capable practitioners to carry on the work of the Canadian Army Medical Service alone. To duplicate the staff in every town of any size was as impossible as it was uneconomical: in fact, the only sensible solution has now been reached whereby such duplication will be prevented. It is proposed to appoint a new officer to be known as Director of Medical

Services to Invalids, who shall deal particularly with the medical treatment of returned soldiers, and the name of Colonel Fotheringham is mentioned in this connexion. Colonel Fotheringham has had wide experience both as A.D.M.S. of the 2nd Military District in Canada, before the War, and A.D.M.S. of the 2nd Division at the Front, where by his energy and ability he has added to his already great reputation.

The new arrangement demands that the Army Medical Service here in Canada must be augmented. This is evident when as we write, we hear that 1,500 returned invalids are reaching Canada this week, and that in a few weeks 10,000 will have been returned. We have no doubt but that those members of the profession who for one or other reason have been detained at home, will volunteer to join the Army Medical Service loyally and with good will.

THE MARLOW MEDICAL REPORT

AT the same time that the late Minister of Militia appointed Colonel Herbert Bruce to report upon the work of the Canadian Army Medical Service overseas in Great Britain and France, he appointed Colonel Marlow, A.D.M.S. Toronto Military District, Inspector of the Canadian Expeditionary Force, to report upon the work of the Army Medical Service in Canada. As Inspector, Colonel Marlow visited various Military Districts and their hospitals and other institutions, and rendered his report to the Minister early in October, at the time when the late Minister was still overseas. The crisis produced by the report of Colonel Bruce led to Colonel Marlow's report being overlooked

It was a straightforward report: a report recognizing fully the difficulties of the situation, giving credit to the Acting Director-General of Medical Services, Colonel Potter, for his indefatigability in the performance of his duties, and making several recommendations in a sympathetic spirit, and in a manner to which none could object. There was, in fact, nothing in the report calculated to afford material for the Minister to attack any one, or for the daily press in search for "good copy" to reproduce in extenso. We cordially sympathize with Colonel Marlow for the little notice that has been taken of what was a careful and useful piece of work on his part. At the same time we would point out to him that it is contrary to military usage that reports of this nature should be published. This report, in fact, has only been made public at a meeting of the Parliamentary Committee upon Returned Soldiers which had its sitting during the last week in February. It deserves note that of the twenty or more recommendations made by Colonel Marlow, the greater number had already been under the consideration of the Adjutant General and the Militia Department.

As for the duplication through the appointment of the Military Hospitals Commission which Colonel Marlow adversely criticized, that has at last been settled in what we trust is a satisfactory manner The matter of recruiting those who are medically unfit has from the first received the attention of the Department. We agree with Colonel Marlow that the blame for recruiting men who are medically unfit rests not upon Regimental Medical Officers, but upon the system of regimental recruiting, the Commanding Officer being only too anxious to secure men by hook or crook. Now that the system has been replaced by draft recruiting, this blot upon the Expeditionary Force should be removed.

With others of his recommendations we cannot wholly agree: the advisability of providing for term contracts of service such as obtains in the Royal Army Medical Corps, and the replacement wherever possible, of the use of Civil Hospitals by Military Hospitals in each district. Regarding the former, looked at from a service point of view, were appointments to the Canadian Army Medical Corps for one year to be established, it would lead to profound dissatisfaction and discontent. Men who have already served for eighteen months or two years or more would regard it as their right to resign forthwith, to the extreme disorganization of the work overseas.

As regards the hospitals, since Colonel Marlow's report was published his very district has afforded an example of the wastage that may be caused by establishing large Military Hospitals in each district. The old Toronto General Hospital buildings were taken over to form a Military Hospital. In the first nine months of 1915-1916 there were abundant troops in the district, and the arrangement seemed admirable; during these winter months, however, with few troops left, the hospital has been largely empty and the staff only partially employed. On the whole, the utilization of existing institutions would seem to be the more economical process, even if the cost of the individual patient per diem is higher. Under present conditions it is those already on the staffs of local hospitals who are most likely to be asked to undertake the care of returned soldiers. Military patients are likely to receive more efficient treatment, therefore, in the institutions at which these officers attend regularly, than they would receive from the same officers at a military hospital at a distance. We shall have, that is, in the future to depend upon the part time services of local practitioners, and it is better to expand than to duplicate their work.

"THE R. P. CAMPBELL MEMORIAL FUND"

One of the greatest losses which Canada has sustained during the conflict in Europe was through the untimely death of the late Dr. R. P. Campbell (Lieutenant-Colonel, C.A.M.C.) on the battle-field in France, where he was engaged in rendering aid to our afflicted heroes. In view of the high esteem in which Dr. Campbell was held both by the profession and laity, his confrères on the staff of the Montreal General Hospital, with the coöperation of some of his personal friends, have decided to perpetuate his name by the establishment of a fund for the training of young medical men. This fund is to be called the "R. P. Campbell Memorial Fund" and will be under the joint control of the Committee of Management and the Medical Board of the General Hospital, for the special training of nominees of the Medical Board for positions on the attending staff of the Hospital, using only the income arising from the fund. The Genito-Urinary Department is to have first claim upon this money, which may, however, be devoted to other departments as occasion arises.

The first idea of the Committee, having this matter in hand, was to found a scholarship at McGill University but upon further consideration it was thought more suitable to devote the memorial to the institution with which Dr. Campbell had identified himself practically from the date of his graduation and in which he had done such good work. This view has been most heartily endorsed by the members of Dr. Campbell's family.

The Committee consists of Messrs. Robert Harrower and F. E. Walker, together with Drs. W. L. Barlow, F. A. L. Lockhart, F. J. Patch, A. R. Pennoyer, and E. M. von Eberts. Subscriptions may be sent to Lieutenant-Colonel F. J. Patch, 33 Bishop Street, Montreal, who is the treasurer of the Fund.

THE ANTITOXIN LABORATORY OF THE UNIVERSITY OF TORONTO

PREVIOUS to May, 1914, with the exception of smallpox and typhoid vaccines, none of the auxiliary weapons of a preventive or curative nature, with which the physician is armed in his fight against communicable diseases (diphtheria, meningitis, etc.), were prepared in Canada. This condition of affairs was not considered desirable, and various medical organizations, including the Canadian Medical Association and the Canadian Public Health Association, had urged the Federal Government to establish a laboratory for the preparation of these biological products, including diphtheria and tetanus antitoxin, anti-meningitis serum, antirabic vaccine (or the Pasteur treatment), and smallpox vaccine. It was further suggested these products be distributed throughout Canada, free of charge, or at a nominal cost. No action of any sort, governmental or private, was taken until 1914.

During the winter of 1914, Dr. J. G. Fitzgerald, the director of the laboratory, with the very cordial and hearty cooperation of Sir Edmund Osler, chairman of the Medical Section of the Commission of Conservation and a Governor of the University of Toronto, undertook to establish a laboratory in the University of Toronto, where these products could be prepared and distributed at cost. In May, 1914, the laboratory was formally opened.

It may be wondered why it was desirable to establish such a laboratory if these products could be freely imported from the mother country or from the United States. The important reasons were three in number. The first of these was that no country in the world of the size of Canada is without laboratories for the purpose. Secondly, the supply of a given product at any time might be insufficient and difficult to obtain; the outbreak of war in August, 1914, and the subsequent great shortage of tetanus serum, illustrated this point. And finally there was the strongest reason of all, the economic reason.

The preparation of these substances requires the services of especially trained experts versed in the methods of immunity. Few such men are obtainable. Then the equipment of laboratories, stables, and so on, is costly and the profits of producers, middlemen and retailers meant that the antitoxin when purchased by the ultimate consumer was very expensive.

The entire success of treating diphtheria antitoxin depends upon the early use of large doses. The use of diphtheria antitoxin in this way in New York State has reduced the death rate from diphtheria from 99 per 100,000 in 1894 to 20 per 100,000 in 1914. It is true that the larger municipalities and hospitals were able to obtain antitoxin at special rates from the manufacturers, that is to say those who were best able to pay were charged the least and, conversely, those whose need was often the greatest and whose purses were slim, were not so favoured. Immediately the Antitoxin Laboratory began the distribution of its products, a dose of diphtheria antitoxin was made available for thirty-five cents, which previously had cost one dollar.

The enterprise at once received every encouragement from several provincial and municipal Boards of Health. The first of these was the Provincial Board of Health of Ontario, which through its Chief Officer of Health, Major J. W. S. McCullough, arranged for distribution through all local boards of health in Ontario of various antitoxins and serums at greatly reduced prices. Dr. M. M. Seymour, Commissioner of Health for Saskatchewan, and Dr. W. H. Hattie, Provincial Health Officer of Nova Scotia, did likewise for their provinces. Several other provincial and local Boards of Health announced their intention of supporting the Laboratory, and soon the movement became national in scope. The Colony of Newfoundland, though outside the Dominion of Canada, is in "the sphere of influence" of the Antitoxin Laboratory, and for two years past all diphtheria antitoxin used in that far away island has come from the Antitoxin Laboratory of the University of Toronto.

The next step in the work was the very advanced and progressive action of the Provincial Board of Health of Ontario when they decided, commencing February 1st, 1916, to distribute free of charge in Ontario, diphtheria antitoxin, tetanus antitoxin, meningitis serum, rabies vaccine (the Pasteur Treatment) and smallpox vaccine. This move put Ontario in the van in public health work and meant that henceforth no child's life should be lost because the parents could not afford to buy antitoxin. No other movement in public health work in Canada within the past decade has received such general endorsation as has this action on the part of the Provincial Board of Health of Ontario.

To keep pace with the work in the preparation of smallpox vaccine, the Antitoxin Laboratory in January, 1916, acquired the plant and good-will of the Ontario Vaccine Farm, Palmerston, from Dr. Coleman.

Meanwhile with the outbreak of war the work of the Laboratory was greatly increased. As has already been pointed out, soon after war was declared there was a great shortage in the world's supply of tetanus antitoxin. This was due to the fact that enormous quantities were required in the Western theatre of war. Within the first three months of the war, there were a great many deaths amongst the wounded from lockjaw. The medical authorities of the various armies decided that in future all wounded men were to receive a protective dose of tetanus serum. Immediately there was a cessation in the number of cases of tetanus observed, and deaths from this dread disease amongst those injected became a rarity. To accomplish this, enormous quantities of tetanus antitoxin were required, and an acute shortage soon occurred.

At this juncture, in the early spring of 1915, the Canadian Red Cross Society had been urgently requested to obtain ten thousand doses of the antitoxin and to send this amount to France. They endeavoured to do so, and found that the lowest price at which serum could be obtained from any manufacturer in the United States was one dollar and twenty-five cents a package. At once arrangements were made with a large municipal public health laboratory in the United States to obtain the much needed supply for the Red Cross Society. It was found that for the price of sixty-five cents each, the ten thousand packages could be obtained. This saved the Red Cross Society approximately one half the amount they proposed to spend.

This incident focussed the attention of the Laboratory on the necessity, if at all possible, of at once undertaking the preparation of this serum. A member of the Board of Governors of the University of Toronto, Colonel A. E. Gooderham, who is also a member of the executive of the Canadian Red Cross Society, at once offered to equip a laboratory for the purpose of producing tetanus antitoxin. At the same time, the Department of Militia and Defence agreed to make a grant of five thousand dollars on the condition that the entire output of the antitoxin whould be available for the use of the Department if they required it. The Antitoxin Laboratory gladly agreed to this and went further and promised to supply tetanus antitoxin at approximately cost price. The special laboratory was at once established under the immediate direction of Dr. R. D. Defries, and for nearly a year and a half has been preparing and sending to France all the tetanus antitoxin required for the use of the Canadian Expeditionary Force, at a price lower than the lowest price quoted by any American manufacturer of tetanus antitoxin. Since the Laboratory began this work over seventy-five thousand packages have been sent overseas.

The work of the Laboratory was much hampered at the outset by the lack of accommodation for horses and other necessary laboratory animals, and because the University did not possess a farm, the horses could not be kept under the best possible conditions. Also the available laboratory space was inadequate. When this became known to Colonel Gooderham he promptly increased his gift many times and purchased a fifty acre farm in York Township about twelve miles north of Toronto. On this farm a magnificent laboratory and stables have been built through Colonel Gooderham's generosity, and the whole property given to the University. H.R.H. the Duke of Connaught has been much interested in this work, and has graciously consented to the laboratories being called the Connaught Laboratories of the University of Toronto. The future work of this department therefore will be conducted under ideal conditions, provided for in a truly splendid fashion by Colonel Gooderham.

Canada now has an institution which is comparable in the scope of its activities to the Serum Departments of the Pasteur Institute, Paris, the Lister Institute, London, and the Research Laboratories of the Health Department of New York City, respectively. These all derive a large part of their support from the preparation and sale of public health biological products, which are supplied to boards of health at low cost. The proceeds above the amount actually required to run the laboratories are used to further research in preventive medicine. As soon as the war is over this is to be done in the Antitoxin Laboratory of the University of Toronto. At present all the energies of the Laboratory are being bent in the direction of war work, since this is the duty of every loyal Britisher to-day.

A MEETING of dentists belonging to the allied forces was arranged by the Paris Dental School and was held at La Tour d'Auvergne from November 10th to 13th, 1916, for the purpose of discussing dental questions which have arisen in connexion with the war. The meeting was well attended and over nine hundred names were enrolled. A number of cases were presented and an interesting exhibition of photographs, radiographs, and so on had been arranged. Over one hundred and fifty communications and reports were read. Monsieur Justin Godart, Sous-secrétaire d'état du service de santé, was in the Chair.

THE treatment of war wounds by means of soap is recommended by Drs. Ratynski and Bergalonne of Paris. A 20 to 40 per cent. solution of white castile soap in warm water is prepared, in which sterilized gauze swabs are dipped and employed to cleanse the surface of the wound which is then freely irrigated with the soapy water and covered with a compress composed of from sixteen to twenty thicknesses of gauze which have been previously soaked in the solution and rubbed vigorously against a piece of soap until they are saturated, then rolled between the palms of the hands until an abundant lather is formed in the interstices. The dressing is finished with a thick layer of absorbent cotton and a bandage. This dressing requires renewal every two or three days, but when changed does not adhere to the wounds or the neighbouring parts and is readily detached without causing any oozing. Remarkable diminution or total disappearance of pain and rapid healing of the wounds has been found to result from this form of treatment.

EARLY in the war the new buildings at Studley, which at that time were not fitted up as laboratories, were offered to the Military Hospitals Commission by the Governors of Dalhousie University. Although this offer was not accepted at the time it was made, the University has now been requested to allow the Commission to use the old Dalhousie building on Carlton Street in which the Faculties of Law, Medicine, Dentistry and Pharmacy are at present housed and at a recent meeting of the Board of Governors it was decided that this should be done. Such a course, in the middle of term time, naturally involves a good deal of disorganization and, to the Medical Faculty, the possible destruction of valuable and delicate apparatus, but the fact that the University is willing to make such a sacrifice in addition to what it has already done is in keeping with the splendid spirit of patriotism manifested by the universities of Canada ever since the beginning of the war.

Canadian Medical Association

THE MONTREAL MEETING

PREPARATIONS for the Annual Meeting in Montreal, June 13th, 14th and 15th, are advancing steadily. The chairmen of the Sections have received a number of replies to their appeal for papers, and everything points to a most interesting and profitable time for those who may be able to attend. It is especially requested that those of our members who may have something of interest to communicate send the title of such communication either to the General Secretary or to the Chairman of the Section in which they wish it to appear, at the earliest date possible. Every member of the Association should make it a point to be present, and we hope that an effort will be made by each of our members to interest the physicians of his neighbourhood in the meeting.

Montreal is now one of the great hospital centres of this continent and visitors are always made welcome by the physicians and surgeons in charge of the clinics.

We would ask our members to pay particular attention to the instructions printed below, on the question of special railway rates and how to obtain them.

RAILWAY RATES

The usual reduced rates are being arranged on all the leading roads terminating in Montreal. These rates will be available for doctors attending the meeting and also for members of their families accompanying them. In order to take advantage of these reduced rates it will be necessary for the physician when starting on the journey to obtain from his ticket agent a standard certificate, properly filled in and signed by the latter. These certificates must be presented to the Secretary of the Association after arrival in Montreal, and also to a special agent of the railways, who will be in attendance on certain days, which will be specified in a later issue. Twenty-five cents will be collected by the Agent for each certificate which, when signed by him will entitle the holder to a return ticket to his starting point, either without further charge, or at the rate of one-third, or two-thirds fare, depending upon the number attending the meeting. Further particulars will be published in a later issue.

Miscellany

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

MEDICAL AND SURGICAL REPORTS OF THE EPISCOPAL HOSPITAL. Edited by ASTLEY P. C. ASHHURST, M.D. Vol. III. Philadelphia: Press of Wm. J. Dorman, 1915.

FOCAL INFECTION: THE LANE MEDICAL LECTURES. By FRANK BILLINGS, Sc.D., M.D. Delivered on September 20, 21, 22, 23, and 24, 1915. Publishers: D. Appleton and Company, New York and London, 1916.

THE PRACTICAL MEDICINE SERIES: COMPRISING TEN VOLUMES ON THE YEAR'S PROGRESS IN MEDICINE AND SURGERY. Under the general editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. VII, OBSTETRICS, edited by JOSEPH B. DE LEE, A.M., M.D., professor of obstetrics Northwestern University Medical School; with the collaboration of HERBERT M. STOWE, M.D., assistant professor of obstetrics, Northwestern University Medical School. Vol. VIII, MATERIA MEDICA AND THERAPEUTICS, edited by GEORGE F. BUTLER, PH.G., A.M., M.D., emeritus professor of therapeutics, Chicago College of Medicine and Surgery. PREVENTIVE MEDICINE, edited by WM. A. EVANS, M.S., M.D., LL.D., PH.D., professor of preventive medicine, Northwestern University Medical School. Series 1916. Publishers: The Year Book Publishers, 327 S. La Salle Street, Chicago. Price, $1.50 net. Price of the series of ten volumes $10.00.

Obituary

LIEUTENANT-COLONEL McLEOD, M.D.

Lieutenant-Colonel Roderick Campbell McLeod, who died at Bramshott on January 4th, was in command of No. 9 Stationary Hospital, the unit contributed by St. Francois Xavier University, Antigonish, Nova Scotia. This hospital was offered to the military authorities rather more than a year ago and, upon its acceptance, was mobilized under the direction of Lieutenant-Colonel McLeod, who proceeded with the unit to England. In October of last year Colonel McLeod, with his unit, took charge of Bramshott Military Hospital, and it was there that he succumbed, after twenty-four hours' illness, to an anthrax infection communicated by a shaving brush through a trifling razor abrasion on the face. His son, Lieutenant McLeod of the Highland Brigade, was in England at the time. Roderick C. McLeod was a Scotch Highlander by extraction. He was born at Margaree, Cape Breton, in 1865, and was educated at Pictou Academy and at St. Francois Xavier University, and graduated in medicine from the University of New York. He had been in practice at North Sydney for over twenty years.

CAPTAIN W. W. McKENZIE, C.A.M.C.

Captain W. W. McKenzie, who died suddenly at the Shorncliffe Military Hospital, was the only son of Mr. Thomas McKenzie of Toronto. Born in Toronto, W. W. McKenzie was educated at the Parkdale Collegiate and entered the University of Toronto as a student of medicine. He graduated in the spring of 1914 and became medical officer at the Hamilton Hospital for the Insane. In April, 1916, Captain McKenzie went to England as medical officer of the 83rd Battalion and was in camp at Shorncliffe for some time. He was transferred to the staff of the Shorncliffe Military Hospital a short time ago. Captain McKenzie was in the twenty-sixth year of his age and was unmarried.

WALTER BAYNE GEIKIE, M.D.

In the death of Dr. Geikie, which occurred at Toronto on January 12th, at the ripe age of eighty-six years, a leading figure has been removed from the medical profession of Canada. Generously endowed by nature with tremendous vitality and a keen intellect, Dean Geikie, as he was affectionately called, inherited from his Scotch ancestors a pertinacity and steadfastness of purpose that carried him over many difficulties in a long and eventful career devoted to the interests of medical education. As the founder of Trinity Medical College and Dean of the Faculty for many years, Dr. Geikie came into contact with numbers of students, who recognized in him a friend worthy of their deepest respect and affection. He threw himself heart and soul into his work and, as a teacher, was particularly gifted with the power of assimilating information and conveying it to his students

Walter Bayne Geikie was born in Edinburgh in 1830, the son of Rev. Archibald Geikie, who came to this country in 1843. He was licensed as a practitioner by the Medical Board of Upper Canada in 1851, having graduated from Victoria University. The following year he received the degree of M.D. from Jefferson Medical College, and in the course of a successful career was the recipient of many honorary degrees from universities in Canada and the United States. In 1856 Dr. Geikie became professor of materia medica in Victoria University, Cobourg, where he was associated with the late Dr. John Rolph, and later was appointed to the chairs of anatomy, surgery and mid-wifery. In 1870 he severed his connexion with Victoria University and a year later suggested the establishment of a medical faculty in Trinity University, Toronto, which, in 1877, was incorporated under an independent charter as the Trinity Medical College. From 1878 to 1903, Dr. Geikie was Dean of the College and professor of medicine and clinical medicine. Under his able direction, the work of the College rapidly developed and its amalgamation with the University of Toronto was a great blow to him.

Dr. Geikie was an early member of the College of Physicians and Surgeons of Ontario and served on the Council from 1877 to 1902; in 1882 he was appointed vice-president. He was president of the Union Loan and Savings Company for some time, and for twelve years was president of the Toronto City Mission. He was also vice-president of the Upper Canada Bible Society, and in 1896 treasurer of the Armenian Relief Fund in Canada.

JOHN SIDNEY GRAY, M.D., C.M.

In the death of Dr. J. S. Gray, who passed away on February 11th, Winnipeg has lost one of its most highly respected citizens and the medical profession an able and devoted member. By his tenderness and skill Dr. Gray had endeared himself to a wide circle of patients in the province of Manitoba, and his zeal, ability, high ideals and devotion to his profession had won the esteem and affection of his colleagues and of all who knew him.

John Sidney Gray was born near Heckston, Ontario, on January 26th, 1850. He graduated from McGill University in 1876 and in 1881 went into practice at Winnipeg, where he was appointed to the staff of the General Hospital, an institution with which he retained his connexion up to the time of his death. After a few years spent in general practice, Dr. Gray went to England and from there to Europe to study gynæcology, and finally took a post-graduate course under Lawson Paige. Upon his return to Winnipeg he was offered and accepted the Chair of Gynæcology in the Manitoba Medical College, a post which he continued to occupy up to the time of his death. When the Manitoba Medical Council was formed in 1886, Dr. Gray was appointed Registrar and for almost thirty years he faithfully performed the numerous duties that fell to his lot in this connexion. He was also the representative of the medical college on the University Board of Studies. Upon the formation of the Medical Council of Canada in 1912, Dr. Gray was unanimously chosen to represent the Manitoba Medical Board upon the Dominion Council. He also acted for many years as medical officer of the Canadian Order of Foresters and as examiner for the Sovereign Life Insurance Company. Dr. Gray was a keen student and contributed a number of articles upon gynæcology to medical literature. He leaves a widow, one son and two daughters.

DR. WILLIAM OLDRIGHT

The death occurred at Chicago on January 2nd, of Dr. William Oldright, of Toronto, one of the oldest graduates of the medical faculty of Toronto University, a brilliant scholar and a successful practitioner for almost half a century. William Oldright was born at St. Kitts, in the British West Indies, in 1843, the son of Major John Oldright and Elizabeth Clucas Oldright. He was educated at the Free Church Academy at Halifax and the Brantford Grammar School and entered the University of Toronto as a student in the faculty of arts, graduating in 1863. He then entered the medical school, from which he graduated M.B. in 1865 and two years later obtained the degree of Master of Arts. In 1869 he became a member of the Ontario College of Physicians and Surgeons, and in 1882 chairman of the Provincial Board of Health. For many years Dr. Oldright was Associate Professor of Clinical Surgery and Professor of Hygiene in the University of Toronto, and was also a member of the Senate of the University. He was at one time vice-president of the Children's Aid Society and always evinced the keenest interest in the promotion of the public welfare. He was associated with St. Michael's Hospital as a member of the surgical staff for many years. He is survived by a widow, five daughters, and two sons.

Dr. Napoleon Robillard died at Montreal on January 31st, in the ninety-first year of his age. He was educated at L'Assomption College, Montreal, and received his license to practise medicine in 1854. He practised for a number of years at Ste. Genevieve in the province of Quebec and became mayor of that village and warden of the county of Jacques Cartier.

Dr. Louis Prosper Bender died at Quebec on January 25th, after a short illness. After receiving his early education at the Quebec Seminary, Dr. Bender graduated from McGill University in 1865 and later was admitted to the College of Physicians and Surgeons of Ontario. He served with the Northern Army during part of the American Civil War. Upon his return to Canada he took up the practice of homeopathy at Quebec. Dr. Bender had a strong literary bent and was a frequent contributor to various periodicals. Among the best known of his writings were a series of Biographical Sketches of prominent men of Quebec, "Literary Sheaves" published in 1881, and "Old and New Canada" which appeared the following year. In 1884, Dr. Bender went to reside in Boston and did not return to Quebec until 1908.

Dr. Thomas Lister died at Rosevear, Alberta, on January 20th in the fifty-first year of his age. Dr. Lister came to Canada from Wisconsin about two years ago and took up practice at Rosevear.

Dr. James Eaton Robertson died suddenly at Midvale, Utah, on February 4th. He was born in Prescott, Ontario, in 1872 and graduated from McGill University in 1895. He enjoyed an extensive practice in Utah and was medical officer of health at Midvale and a member of the State Board of Education.

THE tragic death of Dr. Herdmin occurred at River Hebert, Nova Scotia, on Saturday, February 10th. The young physician had been at River Hebert for about a year, having taken over the practice of Captain J. A. Munroe, C.A.M.C., medical officer of the 185th Battalion. Dr. Herdmin had been to visit a patient at Strathcona, which is about a mile from River Hebert, and was walking along the railway track on his way home when he was knocked down by an engine, ground beneath the wheels, and dragged for a distance of one hundred and fifty feet. As there was a high wind at the time, it is presumed that Dr. Herdmin did not hear the engine. He was the son of the late Mr. Herdmin, a clergyman of Pictou County, and is survived by his mother, who lives at Halifax, a widow, and one child.

DR. A. A. NICHOLLS, of Edmonton, died suddenly on February 16th. Dr. Nicholls graduated from the University of Manitoba in 1902 and had been in practice at Edmonton for some years.

DR. J. R. STEEP, of Winnipeg, died last December at the age of fifty-seven years. He was born at Clinton, Ontario, and was appointed medical adviser in the Department of Indian Affairs.

DR. THOMAS W MUSGROVE, who died at Sultan, Washington, on January 22nd, in the sixty-seventh year of his age, was born at Wickham, Queen's County, New Brunswick. Dr. Musgrove was a graduate of the Harvard Medical School and was in practice at West St. John, New Brunswick, from 1879 to 1889. He was a frequent contributor to literature, both lay and medical.

News

MARITIME PROVINCES

FROM the 6th Annual Report of the Chief Health Officer of St. John, New Brunswick, we learn that the health of that city during the year 1916 has been most satisfactory. With the exception of measles, there has been a pronounced decline in the number of acute notifiable diseases as compared with the previous twelve months. There were two outbreaks of measles during 1916, in

April and in October, and it is probable that many cases occurred that were not reported. The following cases of notifiable diseases were reported during the year: diphtheria, 57 cases, 3 deaths; scarlet fever, 16 cases, 1 death; typhoid fever, 22 cases, 4 deaths; measles 223 cases, 5 deaths; tuberculosis, 139 cases, 63 deaths; typhus fever, 8 cases. Manifest improvement has taken place in the incidence of tuberculosis; in 1914 the death rate from all forms of the disease was 186 per 100,000, and in 1916 it had fallen to 127·26 per 100,000 population. The improvement in the death rate from pulmonary tuberculosis was even more marked, falling from 170·91 in 1914 to 107·06 in 1916. The infant mortality is estimated at 118·8 per thousand births, which also compares favourably with that of 1914 when it was 173·98. The total death rate of the city was 16·41 per thousand, estimating the population at 49,480, the number of deaths being 808. The Isolation Hospital which was destroyed by fire a short time ago, has been replaced by a new and modernly appointed building.

The new armory at St. John, New Brunswick, which was completed just before the commencement of the war, has been taken over by the Military Hospitals Commission and converted into a hospital of five hundred beds.

ONTARIO

The sittings of the Medical Commission under Mr. Justice Hodgins were resumed on January 29th.

Dr. T. L. McRitchie has been appointed medical officer of health of Chatham in succession to Captain George Musson, C.A.M.C., who is on active service.

Of 1,293 children medically examined in the Toronto schools during the month of January only 334 were found to be without physical defect. Three hundred and twenty-three were sufferiing from carious teeth only.

During the year 1916 patients to the number of 136 were treated in the Lady Minto Hospital, Cochrane. Eight deaths occurred.

It was decided at the annual meeting of the Hamilton Hospital Board that as the new hospital, which will be completed next May, will not be filled for some time, the rooms not required immediately should be lent to the Hospital Commission for the accommodation of returned soldiers. It was reported at this meeting that during 1916, 6,849 patients had been admitted to the hospital, or 957 more than during the previous year. The number of patients treated in the public wards and the outdoor department was rather less than in 1915, due no doubt to improved conditions among the poorer classes.

The plans for an isolation hospital to be built at Windsor are in course of preparation and will be laid before the city council with a strong recommendation that such a hospital be built in the near future.

The annual meeting of the Peterborough Health Association took place on January 19th. The year's work has been accomplished under unusual difficulties on account of the war, but in spite of that much has been done. During the twelve months under consideration 187 patients have been visited by the district nurse, the total number of visits made being 2,050 of which 548 were paid for by the patients. Twenty-nine tuberculous patients were under observation and daily treatment was given in six cases. Milk, eggs, drugs and medical supplies were distributed to a number of families.

The members of the Provincial Board of Health appointed for the year 1917 are Dr. Adam Wright of Toronto, chairman, Dr. A. A. Weagant, of Ottawa, Dr. T. E. Kaiser of Oshawa, Dr. J. Roberts of Hamilton, Dr. W. H. Howie of Sudbury and Dr. H. R. Casgrain of Windsor.

It is announced that the city council of Toronto has decided to apply to the Ontario Legislature for permission to issue debentures to the extent of $150,000 for the erection and equipment of buildings for the care of the feebleminded.

QUEBEC

The annual meeting of the Board of Governors of the Verdun Hospital for the Insane was held on January 7th. During 1916 patients to the number of 962 were given treatment in the hospital as compared with 911 during the previous year, and on December

31st, 1916, there were 766 patients in the institution, including about an equal number of men and women. Twenty returned soldiers were admitted during the year, thirteen of whom were still under treatment at the time the report was written. Of the patients admitted 109 were Canadian born. The principal cause of insanity, in the opinion of the medical superintendent, Dr. Burgess, was mental anxiety. Drink and drugs were responsible for a certain proportion, as were also such factors as heredity, senility, vice and so on. Sixty-one deaths occurred during the year, general paresis being the most frequent cause. The work of the institution has been hampered through lack of sufficient accommodation, the normal capacity being 700. The addition of a nurses' home, which has been built during the past year, has ameliorated conditions to some extent.

The use of the water of Lake St. Louis for drinking purposes came up for consideration at a recent meeting of the Superior Board of Health of the province of Quebec. A number of reports were submitted to the Board, which showed that the water from the lake was not fit to drink unless properly filtered, and an order was issued to the towns of Ste. Anne de Bellevue, Pointe Claire, and Dorval to instal filtration plants before next October It was decided to take up the question of the water supply of Lachine at a subsequent meeting of the Board. A request made by the city of Hull, that the order to instal a filtration plant be suspended, was refused, the Board being of the opinion that chlorination of the drinking water as now practised was a temporary measure only and at times non-efficacious. Moreover, the Board considered that the financial position of Hull was such as to permit of the installation of a proper filtration system which would ensure a supply of pure drinking water.

The Board signified its approval of the following amendments to the Quebec Public Health Act:

1. Plans for waterworks, filters, sewerage systems, and sewage disposal submitted to the Superior Board of Health to be prepared by engineers qualified to practise in the province.
2. That no by-law providing for the raising of money for the construction, alteration, or extension of any works coming under the jurisdiction of the Board of Health be submitted to the votes of the electors without first being approved by the Board of Health.
3. That extensions or alterations to existing works be submitted to the Board of Health for approval.

4. That rules should be drafted to cover the preparation and submission of projects.

MANITOBA

The annual report of the Manitoba Board of Health was presented to the provincial government on January 24th. The report was of more than usual interest and contained several important suggestions, namely, that following the example of Ontario the province of Manitoba should be divided into sanitary districts, each in charge of a properly trained medical officer who would devote his whole time to public health work in that district, that the position of health officer should have a greater degree of permanency and the remuneration should be based upon the population of the area under his control, that a voluntary organization of health officers of the province should be founded with a view to consultation and united action in the adoption of the most approved modern methods of health work, and that the necessary steps should be taken to regulate the supply of meat and milk throughout Manitoba. The importance of vital statistics was pointed out and the necessity of sending in proper returns insisted upon; at present such returns are made intermittently and therefore are of no practical value. The report states that of 5,000 children examined in the public schools, 1,260 were found to require medical or dental attention.

The annual meeting of the board of governors of the Brandon General Hospital took place on January 15th. During the past year 1,900 patients were admitted to the hospital which was occupied to its full capacity throughout the year and at times overcrowded. From a financial standpoint, the year 1916 was a good one.

SASKATCHEWAN

Dr. Armstrong, of Kingston, Ontario, has been appointed house surgeon of the Regina General Hospital in succession to Dr. de Martini.

BRITISH COLUMBIA

At a meeting of the Board of Directors of the Vancouver General Hospital on January 25th, communications were read from a number of hospitals in the province referring to a convention of the hospitals of British Columbia which it is proposed to hold in the near future. The matter was referred to the incoming board for further consideration.

Subscriptions to the amount of over $20,000 have been received towards the $35,000 required for the military hospital which it is proposed to build at Vancouver.

MEDICAL COLLEGES

McGill University

A special convocation took place at McGill University on February 6th, in order that the degrees of M.D. and C.M. might be conferred upon those students who had taken the special course in medicine commenced last summer so that they might graduate and enlist for overseas service as soon as possible, and who had been successful in passing the examinations held upon the termination of the session. A high standard of efficiency has been maintained throughout the session and out of fifty-three candidates forty-three were successful in passing the examinations. The following are the names of the successful candidates:

Henry Baby, Chatham, Ont.; C. H. P. Benning; S. D. Bernard, Spanish Town, Jamaica, B.W.I.; A. Bissember, Berbice, British Guiana; E. M. Blair, Truro, Nova Scotia; A. W. Brodie, Smith Falls; J. F. L. Brown, Middle Southampton, N.B.; B. L. Cahanna, Montreal; H. B. Church, Aylmer East; H. St. G. Clarke, St. John; F. J. Coughlin, Montreal; Edward Craig, North Gower, Ont.; Albert Desparois, Montreal; F. N. K. Falls, Ottawa; A. F. Gillis, Miscouche, P.E.I.; K. G. Grant, Bristol, England; W. Halpenny, Galetta, Ont.; R. C. Hastings, Malone; F. A. Johnson, Oshweken, Ont.; J. R. Laing, Montreal; A. S. Lamb, Ballarat, Australia; R. G. Lawrence, Revelstoke, B.C.; E. W. Lunney, St. John; O. O. Lyons, B.A.; Waterville, N.S.; John MacDonald, Stratford; W. F. MacIsaac, Antigonish, N.S.; O. V. Marsh, Jamaica, B.W.I.; L. M. Matthews, Port Arthur; J. D. Moore, Victoria; J. R. Nugent, B.A., St. John; J. B. O'Reilly, St. John's, Nfld.; V. H. T. Parker, Belle Isle, N.S.; C. E. Pengelley, Jamaica, B.W.I.; T. E. Perez, San Domingo, W.I.; G. G. Phillips, Cornwall; I. M. Rabinovitch, Toronto; T. M. Richardson, B.A., Balderson, Ont.; J. D. Robinson, Saskatoon; F. J. Scully, B.A., St. John; M. H. Sacksner, Montreal; H. P. Swancesky, New Westminster; H. L. Warshawsky, B.A., Montreal; T. G. Wolff, B.L., Montreal.

The degrees of M.D., C.M., were also conferred upon the following gentlemen who completed their medical studies in September last: F. E. Gullison, of Yarmouth, Nova Scotia; H. T. Jost, B.A., of Guysboro', Nova Scotia; W. H. Miller, of Victoria; and W. J. Stevens, of Arnprior, Ontario.

The honours are as follows:

Aggregate of all subjects: 1, O. V. Marsh; 2, T. M. Richardson, B.A.

Medicine: 1, T. M. Richardson, B.A.; 2, W. F. McIsaac; 3, R. C. Hastings; 4, G. G. Phillips.

Surgery: 1, O. V. Marsh; 2. T. M. Richardson, B.A.; 3, R. C. Hastings

Obstetrics: 1, O. V. Marsh; 2, J. D. Moore; 3, A. S. Lamb.

Gynæcology: 1, I. M. Rabinovitch; 2, Henry Baby; 3, A. S. Lamb and J. D. Moore; 5, T. M. Richardson, B.A.; 6, G. G. Phillips.

Ophthalmology: 1, J. D. Moore; 2, M. H. Sacksner; 3, C. H. Benning and C. E. Pengelley.

Oto-laryngology; 1, J. D. Moore 2, W. Halpenny and F. A. Johnson; 4, J. McDonald.

Pathology: 1, E. W. Lunney; 2, F. N. L. Falls; 3, K. G. Grant; 4, A. S. Lamb; 5, J. D. Moore; 6, J. Dean Robinson; 7, E. E. Rogers; 8, F. J. Scully; 9, R. C. Hastings, and T. E. Perez.

ARMY MEDICAL SERVICES

The appointment is gazetted of General Guy Carleton Jones, C.M.G., as Inspector-General of the Canadian Medical Service in Canada, England, and France, and of Colonel Gilbert Lafayette Foster, C.B., as Director-General of the Canadian Medical Service. Colonel Foster has served with distinction as A.D.M.S. of the First Canadian Division, and later as D.D.M.S. of the Canadian Expeditionary Force in France.

Colonel Herbert A. Bruce, C.A.M.C., of Toronto, is reported to have been appointed Consulting Surgeon with the British Medical Services in France.

Major A. J. Amyot, C.A.M.C., Director of the Ontario Board of Health Laboratories and Professor of Hygiene in the University of Toronto, who went to the front with the Toronto University Base Hospital, has been appointed Sanitary Adviser in England to the Canadian Forces.

THE Military Cross has been awarded by His Majesty to CAPTAIN WILLIAM MALLOCK HART, C.A.M.C., "for conspicuous gallantry and devotion to duty. He displayed great courage and skill in evacuating wounded under most trying conditions. On one occasion he worked for several hours in the open under heavy fire attending to the wounded. He has previously done fine work."

SERGEANT-MAJOR E. DAVIS, C.A.M.C.

CAPTAIN ADAM F. MENZIES, R.A.M.C. Captain Menzies graduated as gold medalist from the Manitoba Medical College and soon after the outbreak of war joined the Royal Army Medical Corps. He was severely wounded last December. Before going to the front he served for a year as house surgeon in the Winnipeg General Hospital.

THE following promotions have been gazetted in the Canadian Army Medical Corps: To be Lieutenant-Colonel: Dr. J. L. Chabot, M.P., of Ottawa. To be temporary Lieutenant-Colonel: Major G. R. Philip. To be Major: Captain J. N. Gunn, of Calgary. To be temporary Captain: C. D. Rilance, M.B. Late temporary Lieutenants R.A.M.C. to be temporary Captains: L. M. Morton and O. G. Donovan.

CAPTAIN W. C. L. McBETH, C.A.M.C., who recently returned from the front, has been appointed medical officer in charge of the Hamilton Military Hospital in succession to Major D. G. McIlwraith, C.A.M.C. Captain J. A. MacCallum, C.A.M.C., who has also recently returned from the front, has been appointed assistant to Captain MacBeth. It will be remembered that the Military Cross was awarded to Captain MacCallum last June on the occasion of the King's Birthday.

CAPTAIN E. C. WILFORD, C.A.M.C., who recently left Toronto for service overseas, returned to Canada a short time ago from Tzeliutsing, West China, where he has been for the past eight years. Dr. Wilford was born at Blyth, Ontario, and graduated from Toronto University. He afterwards did post-graduate work in London and Edinburgh, and was subsequently sent by the Methodist Church of Canada as a medical missionary to Tzeliutsing, a city of about a million inhabitants but at that time without a hospital of any kind. During his stay in Tzeliutsing Dr. Wilford was able to collect subscriptions to the amount of $10,000 in Chinese currency, for a hospital which was almost completed before he left China. He also organized Red Cross work in Tzeliutsing.

The appointment is announced of Colonel J. A. Roberts, C.A.M.C., as Commandant of the Duchess of Connaught Canadian Red Cross Hospital at Cliveden.

Lieutenant-Colonel W. M. Hart, C.A.M.C., of Regina, who was a prisoner in Germany for some months, is now attached to the staff of the Granville Special Canadian Hospital at Ramsgate. Major Robert Wilson, C.A.M.C., of Montreal, is also on the staff of that hospital.

Captain Scrimger, V.C., C.A.M.C., of Montreal, is now at the Headquarters of the Canadian Medical Services in London as examining officer for the medical board.

Lieutenant W. H. Lloyd, C.A.M.C., has been appointed medical officer of the 235th Battalion.

Lieutenant Ellis, C.A.M.C., is on duty as medical officer at the 77th Battery Depot at Regina.

The following physicians have been appointed members of medical boards for the examination of recruits in the province of Saskatchewan: District of Melville—Dr. D. R. Livingstone and Dr. Crosby. District of Estevan—Lieutenant R. N. Tripp and Dr. French. District of Watrous—Dr. W. E. Hixon, Dr. Wm. Y. Cook, and Dr. S. Mathieu. District of Yorkton—Captain C. M. Henry, Dr. T. A. Patrick and Dr. Broughton. District of Maple Creek—Dr. Alexander Fettes and Dr. F. B. Dawson.

Captain F. R. Nicolle, C.A.M.C., has returned to Chatham, Ontario, on sick leave. Captain Nicolle contracted trench fever at the front and has been in hospital in England for some time.

Captain A. H. Davies, R.A.M.C., of Vancouver, who was formerly in practice at Delhi, Ontario, is surgeon on the hospital ship *Guildford Castle* which is plying between East African ports and Capetown.

No. 8 Canadian Stationary Hospital, under the command of Lieutenant-Colonel H. E. Munroe, C.A.M.C., of Saskatoon, is stationed at Hastings and has taken over the Canadian Military Hospital there.

Dr. Fred Adams, epidemiologist to the Toronto Board of Health, has left for overseas service.

No. 4. Canadian Casualty Clearing Hospital has been transferred from Shorncliffe to Ramsgate.

The Royal Red Cross of the First Class has been awarded to Matrons H. Casault, E. C. Rayside, E. Russell, and M. Smith. This Order of the Second Class has been given to Nursing Sisters E. L. Bell, E. Boultbee, C. Cameron, M. Clint, E. Drysdale, M. P. Ellis, M. C. English, H. L. Fowlds, A. M. Gallop, G. A. Gray, H. Harvey, L. Holland, C. Hood, M. Howe, A. E. Johnston, J. Johnstone, M. MacAffee, H. A. MacLaughlin, M. R. Marsh, G. H. Mavety, N. C. McCurdy, G. B. McPherson, M. Motherwell, E. F. Pense, J. Robertson, M. Rose, I. B. Smith, I. D. Strathy, and F. H. Wylie.

CASUALTIES

Died

Captain W. W. McKenzie, C.A.M.C., 66 Melbourne Avenue, Toronto.

Injured

Captain Hamilton, C.A.M.C., of Revelstoke, British Columbia. [Captain Hamilton, who is the medical officer of a Kootenay Battalion, was injured by a motor lorry while his battalion was in rest billets after safely passing through the battles of the Somme. He has been invalided to Canada.

Ill

Major D. B. Bentley, C.A.M.C., of Sarnia, Ontario.

Canadian Literature

Original Contributions

The Canadian Practitioner and Review, January, 1917:

Presidential address	P. H. Bryce.
Osteitis deformans	C. Sheard.

The Canadian Practitioner and Review, February, 1917:

Heat as a method of treatment in some forms of cavity carcinoma	F. P. Percy.
The Toronto Reception Hospital	H. Clare.
Cæsarean section—clinical case	F. C. Stevenson.

The Canadian Journal of Medicine and Surgery, January, 1917:

University Hospital, Ann Arbor. The Psychopathic Pavilion	J. N. E Brown.
An improved formula for the preparation of Dakin's solution	N. A. Powell.

The Canadian Journal of Medicine and Surgery, February, 1917:

Hypochlorous acid in surgery	C. H. Gilmour.

The Western Medical News, December, 1916:

Eclampsia	Geo. P. Bawden.

The Canada Lancet, December, 1916:

The law and the doctor	W. R. Riddell.
On the selection of an operation for enucleation of the eyeball	G. Sterling Ryerson.

The Canada Lancet, January, 1917:

The protein poison in immunity and disease	Victor C. Vaughan.
Corrigan's investigations on the cardio-vascular system	W. Ewart Ferguson.

Medical Societies

PERTH COUNTY MEDICAL ASSOCIATION

The annual meeting of the Perth County Medical Association took place at Stratford, Ontario, on February 8th. The officers elected for the year 1917 are: President, Dr. A. D. Smith of Mitchell; vice-president, Dr. A. A. Knox of St. Mary's; secretary-treasurer, Dr. F. J. R. Forster of Stratford; local secretaries: Stratford—Dr.

Gemmell; St. Mary's—Dr. J. R. Stanley; Mitchell—Dr. Armstrong; Listowel—Dr. Nichol. A resolution was passed to the effect that the provincial government be requested to define the meaning of the words "practice of medicine", and to prevent the use of the title "doctor" by unauthorized persons. A resolution was also passed in favour of amalgamation with the Ontario Medical Association.

SASKATCHEWAN MEDICAL ASSOCIATION

A SPECIAL meeting of the Saskatchewan Medical Association took place at Regina in December last, to discuss certain proposed legislation mentioned in a communication from the Premier of the province. A report was presented by the committee appointed at the last annual meeting of the Association to consider the question of the provision of medical attendance for settlers in sparsely populated districts of the province, to the effect that a set of resolutions had been drafted and presented to the Department of Municipal Affairs at Regina. It was resolved that the Council of the College of Physicians and Surgeons should be requested to proceed at once to have a survey made of the medical profession of Saskatchewan with a view to consultation, so as to improve and increase efficiency.

PETERBOROUGH MEDICAL SOCIETY

A MEETING of the Peterborough Medical Society was held on February 8th, at which a most interesting and instructive paper was given by Dr. Moir of Peterborough, entitled "Ulcers of the Stomach and Duodenum, with report of Cases." After the discussion which followed, a hearty vote of thanks was tendered to Dr. Moir.

The next meeting will be held on March 2nd.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE third regular meeting of the society was held Friday November 3rd, 1916, Dr. W. S. Morrow, president, in the chair.

LIVING CASE: Dr. R. J. Ericksen of the Royal Victoria Hospital presented a living case of Vaquez's disease.

DISCUSSION: Dr. Maude E. Abbott. I would like to know whether the white cell count is usually increased in these cases and whether if it is, that may not be a differential point in the diagnosis of these polycythæmias from such as occur in high altitudes and general cardiac disease. I would also like to ask how long do these cases last? Dr. O. S. Hillman, one of our graduates, now connected with the Post-Graduate School of New York, sent us up two or three years ago a large full-sized slice of a spleen, removed by splenectomy, from one of the cases studied by Dr. Osler, and upon which his study of this so-called "Osler's disease" was based.

Dr. C. F. Martin: The leucocytosis is rather peculiar to this condition but the essential feature of diagnosis is the enlarged persistent spleen. The duration is often long, one case lasted thirteen years and another nineteen.

Pathological Specimens: Series of Dr. Horst Oertel.

1. This specimen of liver carries the weight of an experiment. It is from an old man who entered the Royal Victoria Hospital to have a prostatectomy done; no one had any idea that there was anything else the matter with him save an enlarged prostate. The operation was to be done in two stages; unfortunately he died shortly after the first stage though the operation was itself successful. At autopsy there were found evidences of senility and no particular cause of death. But a most remarkable condition was disclosed in connexion with the liver. The common bile duct of the liver was obstructed by numerous stones, with a very large egg-shaped one embedded deeply in the mucous membrane of the ampulla, so that it is hard to imagine how this stone could have been movable. Above it were other larger and smaller stones, apparently tightly blocking the common bile duct. The hepatic duct was also blocked by a number of stones and going up farther in its first branches to the right and left lobe of the liver were found more stones within dilated ducts. In the gall bladder itself were a large number of stones. Now it seems that the blocking by these stones must have been practically complete, and yet there did not exist in this case any jaundice at all and further examination proved that the liver did not show any evidence of bile stasis, save a moderate dilatation of the biliary ducts in the portal spaces.

I will not go into a theoretical discussion of the causes of jaundice, but it is of very great importance to know that a complete blocking of the common duct, of the hepatic duct and of the primary branches of the hepatic duct may occur without appreciable symptoms and especially without any jaundice. Microscopically the liver shows cystic dilatation of interlobular bile ducts, but no cholangitis, pericholangitis and no inter or intralobular bile stasis. There were further no capillary bile thrombi and no bile pigmentation within the lobules. (It is proposed to report this case in detail later.)

2. This second specimen of another liver is of considerable interest and importance to-day as it concerns the anatomical findings in trinitrotoluene poisoning of which a considerable number of cases have occurred recently and are still occuring in connexion with ammunition work. This concerns a young man, a medical student, who during July and August worked for about six or eight weeks in ammunition works. He was exposed to the trinitrotoluene fumes and also did a thing which, I have since learned, is occasionally indulged in by these workers—he exposed himself voluntarily to the vapours of toluene producing the effect of an intoxication. Like other cases, he developed jaundice and on account of increasing weakness left the works. He improved so much that in the autumn he returned to college, though still slightly jaundiced and even reported for military service, but was advised by the physical examiner to abstain from this exercise for some time. Suddenly, on October 18th, he was taken ill with profuse hæmorrhages from the nose and also from bowels and kidneys. He went down extremely rapidly after entering hospital, collapsed and died within forty-eight hours of admission. Autopsy disclosed the following interesting findings which throw light on the nature of this poisoning. In the first place there are diffuse and profuse hæmorrhages in practically all the parenchymatous organs. The whole pelvis of the kidney as well as the ureter were blocked by coagulated recent blood; there were hæmorrhages (ecchymoses) in the skin, pericardium and intestines. The left lobe of the liver is very much diminished in size, collapsed, flat, extremely hæmorrhagic so that all markings have disappeared. The right lobe is enlarged and presents an interesting and most peculiar picture.

It shows a tremendous parenchymatous swelling which is greyish, not yellowish and fatty as seen in the toxic atrophies of the liver, and this swelling has produced a peculiar relief-map appearance of the parenchyma around depressed vascular channels. On microscopic examination two or perhaps three stages of the process may be recognized, the first one is represented by a tremendous œdematous imbibition and swelling which separates the liver cells widely and ultimately produces an œdematous solution of these cells, but without any parenchymatous degeneration or fat infiltration; the liver cells as a result of this cytolysis simply dissolve as in prolonged venous stasis. The necroses which are both central, and peripheral, are primarily streaky and by confluence produce a striking picture separating preserved tissue. It appears that by extension all liver tissue collapses entirely and a profuse hæmorrhage occurs into collapsed areas; this latter stage is shown in the left lobe where all structure is gone, and lobular differentiation is lost. Finally as a last stage it appears that as in the acute yellow atrophies a periportal lymphoid infiltration takes place which extends from the periphery of the lobule to the hæmorrhagic centre and displays numerous capillary bile ducts.

Now the interpretation which I base upon these findings is that trinitrotoluene is not a parenchymatous poison proper, but a vascular one injuring the endothelium of blood vessels and lymphatics. As a result of this nutritive interference massive oedema results which brings on cytolytic necrosis and free hæmorrhages into the collapsed area which ultimately replace the liver tissue. In some of the later pictures of the hæmorrhagic stages a resemblance to acute yellow atrophy is noticeable, but it can be easily differentiated by the features just described. Noteworthy is especially absence of fatty changes, coagulation necrosis and lack of marked bile precipitation. (This case will be reported in detail later by Dr. Odland). The specimen was illustrated by lantern slides.

Discussion: Dr. E. H. Mason: The post-mortem findings in this latter case throw a great deal of light upon another case we now have for treatment. The man after working continuously for twenty-four days in the crystallizing plant of a powder factory was noticed to be jaundiced by the physician in attendance. Otherwise he suffered only stray indefinite abdominal pains. He was sent to hospital but we could not make out very much except this slight degree of jaundice; barium meal test showed adhesions between stomach wall and gall-bladder region. Since then he has developed a generalized œdema, above the diaphragm as well as below; it appeared first in the legs, then free fluid developed in the abdominal cavity and in both pleural cavities as well as œdema of the arms. If this poison acts on the endothelial lining of the lymphatics and the small arterioles, as it seems to do, it throws a great deal of light upon the development of these cases. The man's heart is perfectly good, normal size, blood pressure normal, pulse rate good, no increase, electrocardiogram shows no degeneration of the heart muscle and we have come to the conclusion that the general œdema is the result of the trinitrotoluene chemical.

The patient from whom Dr. Oertel's specimen was taken entered hospital on the 18th with a history of, twenty-four hours before having hæmorrhage from his nose, then two from his bowels, and on admission to the hospital two more from the bowels, although not enough to cause marked anæmia. Two subcutaneous hæmorrhages were noticed on the left thigh. There was complete anuria due to massive hæmorrhages in the pelvis of both kidneys. On catheterization 5 c.c. of urine showed a great deal of blood; no crystals of tyrosine or leucine. The liver dulness was not decreased and there was no free fluid in the abdominal cavity at 6:30 p.m., but at 12 o'clock the heart showed complete collapse, the pulse rate went up, heart weak and rapid. Under stimulation he lived until 6:30 in the morning, when he died.

Dr. Lautermann: I would like to ask if Dr. Oertel has any suggestion to make as to the cause of the dissolution in that first case with the stones in the liver.

Dr. H. A. Lafleur: I presume that it is not intended to convey that all these cases are necessarily fatal. I imagine it is a case of time of exposure, etc. One case I saw this year made to all intents and purposes a good recovery, and nothing could be made out in the examination before he left the hospital to suggest that he was going to come to a speedy end. All the organs seemed to be sound and yet there was no doubt that it was a definite case of poisoning from this chemical. He had an intense jaundice, the kind you get from a complete obstruction of the bile duct; it lasted much longer than catarrhal jaundice and was accompanied by a good deal of depression with gastro-intestinal distress, but he made a good recovery. I would like to know if, in the experience of those who have seen much of this condition, the impression is general that these cases are always ultimately fatal, or whether it is possible to recover.

Dr. Horst Oertel: With regard to Dr. Lautermann's question as to the exact and direct cause of death in the first case, we had nothing to suggest it beyond the fact that he was an old, poorly-nourished man with advanced visceral senile changes, but there was nothing to show the immediate atrium mortis.

Papers: 1. Transfusion of blood, by Dr. C. K. P. Henry. (This paper appeared in the January number of the Journal.)

2. Longitudinal sinus transfusion in infancy, by O. M. Tarr. (Published in this issue.)

Discussion: Dr. E. W. Archibald: I was very much interested in Dr. Henry's paper and must congratulate him on such a successful series of transfusions. Possibly the members might be interested in a short account of the transfusions we did on the other side during the past eighteen months. We had a series of nine, or rather, ten in nine patients. Two of these were under Major Hill's care. Very briefly the results were as follows: there were of secondary hæmorrhage five cases. All were moribund; no transfusion was done unless obviously there was no chance of saving life otherwise. All were pulseless or practically so. Secondary hæmorrhage in infected wounds was our greatest bugbear. Of these five cases two were saved. In the three others, although there was marked immediate improvement with return of colour and of pulse, relief of the lethargy of acute anæmia, yet death took place from repeated hæmorrhages. Transfusion of whole blood does not in secondary hæmorrhage give you sufficient clotting to prevent a recurrence of hæmorrhage. There were four other cases in which transfusion was done; in two it was for serious hæmorrhage combined with severe infection. These were done at a casualty clearing station, and both died of gas gangrene in twenty-four hours, although an immediate improvement had been marked. In two others, abdominal injuries with severe shock, the patients likewise died. These two shock cases were in marked contrast to those suffering from hæmorrhage in that there was no sign whatever of improvement following the transfusion. I came to the conclusion, which I believe Libmann and Ottenberg of New York had also formed, that transfusion of blood in cases of shock is valueless. As a matter of fact one really ought not to expect much improvement in shock, because that clearly is some upset of the rhythm of circulation and is not essentially due to loss of volume of blood. In these cases of shock then, not combined with hæmorrhage, it is probably useless to do transfusion.

Of the nine cases only two recovered; but in the others the transfusion was negatived by conditions over which control was quite impossible,—recurrence of hæmorrhage, shock and gas gangrene. Of course the free use of transfusion in the army is discouraged by some commanding officers because of the risk of disabling the donors. The donors are usually men with slight disabilities who might otherwise very quickly be returned for duty, say a sprained ankle or a slight wound; and who might, if there was a possible chance of making anything out of the loss of blood, claim a week or two weeks' leave. Consequently commanding officers are not very keen on risking donors who are needed as fighting men, unless the chance of success is reasonably sure.

Apart from this personal experience I have had knowledge of the experience of others concerning the use of the method for chronic sepsis; I refer to that type of chronic fever which persists although the wound is perfectly drained, and where evidently there is lack of resistance. Transfusion has been found in quite a number of these cases to do good, apparently through the addition of hæmoglobin. Certainly chronic sepsis was in some instances fairly rapidly overcome, and I believe that in civil and hospital practice there will arise a considerable number of cases where this can be done. I used the Kimpton-Brown tube in five cases, and the citrated blood in the other four. In one of the cases of citrated blood, the patient after receiving three or four ounces lost consciousness, threw back his head, his eyes rolled up, breathing was slightly disturbed, and, if possible, he grew even more pale than before. We stopped transfusion and in five or ten minutes he came around and had no remembrance of having lost consciousness. The condition was probably due to isoagglutinins. Bruce Robertson of Toronto had one death, probably from hæmolysis. The evidence seems to be accumulating that if we select our cases properly and settle upon definite indications, the procedure, which is quite simple enough, is practically without danger and may very frequently be of great use.

3. Certain psychogenetic conditions in soldiers, by Major C. K. Russel.

THE fourth regular meeting of the society was held Friday, November 17th, 1916, Dr. W. S. Morrow, president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. J. W. Scott.

1. Lung: Pneumonia, due to infection with Bacillus Mucosus Capsulatus.

PAPER: The paper of the evening was given by Dr. D. H. Ballon on the complications of mastoiditis.

DISCUSSION: Dr. E. Hamilton White: I would like to congratulate Dr. Ballon on this interesting paper, and also on his successful operative cases, which I think form the most striking feature of his contribution. He has very clearly described the classical picture of the various complications and the fact that he is able to show us successful results following operative treatment of sinus thrombosis, will bring home to all the great advances that have been achieved in the surgery of this region. As he points out, early diagnosis and early operation are essential to success and we have to thank Dr. Gustave Alexander of Vienna for much brilliant work on this subject. In a large series of cases of sinus thrombosis he got as high as

60 per cent. recoveries in a condition formerly regarded as always fatal.

Unfortunately some cases are rather atypical and quite difficult to diagnose. I can remember several cases in Dr. Birkett's service at the Royal Victoria Hospital in the past eight years where there were decidedly atypical features, others were of more classical type. The proportion of these cases which recovered has been most encouraging. The point which should be impressed most forcibly in the question of the diagnosis of sinus thrombosis is the occurrence of a chill. That is the cardinal symptom and occurring during the course of an otitis should always suggest the presence of a sinus thrombosis.

The prognosis, even with early and skilful operation, depends upon the nature of the infection and the resistance of the patient. In chronic suppuration there is apt to be poor recuperative power as a result of prolonged absorption from the infected area and the results are apt to be unsuccessful. In acute infections the outlook is much better, especially if the patient has had robust health up to the time of the occurrence of the otitis.

As to the question of epidural abscess, in my experience the peri-sinus abscess is by long odds the most common form, as owing to the presence of the large cells at the tip of the mastoid it is very common to have abscess formation in this region. In these cases the bony walls of the cell are eroded and the lateral sinus forms one wall of the abscess cavity. Facial paralysis is not so very uncommon in the acute cases and the results are favourable if the pressure is quickly relieved. In chronic cases with destructive changes in the bone and long standing paralysis, a recovery of the nerve is not to be expected, but the indication for a radical mastoid operation to arrest the destructive disease in the bone is urgent.

DEMONSTRATION: Sphagnum moss as a surgical dressing.

Professor Porter showed specimens of the living moss and of dried and graded material, dressings already made up, jars containing specimens of the moss and others with absorbent cotton, in each of which had been placed an equal quantity of water to illustrate the absorbency of the two materials. Many slides also were shown, first of bogs, then of the plant itself, giving details of the various species, and then pictures illustrating the process of gathering the moss and preparing the finished material ready for use in the hospital.

DISCUSSION: Dr. H. A. Lafleur: It is not the custom of this society to move a vote of thanks to any of its members for a contribution but I think we ought to make an exception in this instance and propose a vote of thanks to Professor Porter for his extremely interesting and instructive address on a very practical subject. This was seconded by Dr. von Eberts and unanimously carried.

Dr. E. W. Archibald: There is not much that I can say in discussing this subject except possibly from the purely surgical standpoint. Sphagnum moss was just coming in at Boulogne when I left; we had received a few dressings. As a matter of fact I had asked the operating room to get me some, but I had no chance to try them out. I have read one or two articles about it and from this, as well as what Professor Porter has taught us to-night, I feel that it is a valuable product, and as soon as arrangements can be made I hope some may be left in Canada for our use. The uses of the material are obvious. As Professor Porter has demonstrated, absorbent cotton is frequently not absorbent in that it soon reaches its limit, and dressings have to be changed very frequently. Again the cotton tends to retain pus, and makes the dressing a mere pus poultice. I should think the capillarity of this moss will make it an active drain and produce an active stream from the cavity to the exterior. I remember Sir Almroth Wright giving a very interesting demonstration of the active effect of the capillarity of the ordinary wick suspended as a syphon in a bottle of water; and I am sure that if we had wicks made of this moss we could soak fluid up to even greater heights than with the ordinary wick. Its uses then are quite obvious; and although I had no actual experience with it on the other side, I propose, as soon as the Red Cross can allow us to have any here, to make a trial of it.

Prof. J. B. Porter: Dr. Archibald spoke of making wicks of this moss. For some years now Germany has been using a coarse grade of moss for the purpose of protecting mines against dust explosions. Just before the war I brought from Germany samples of sphagnum linings for mine air ways. These linings are made by taking chicken wire netting and weaving two thicknesses of it together with a layer of an inch or more of pressed sphagnum between them. This is made in strips of say eight feet high, tacked against the walls of a place which it is wanted to make fireproof and damp, the foot of this lining rests in a gutter of water, with the consequence that the whole wall from the gutter up is kept wet.

An interesting coincidence this evening is that Dr. Symonds, after hearing me speak of how this moss grows on the moors on the Continent and in England and Scotland intermixed with the heather, the roots of which are often surrounded and embedded in moss, mentioned that in a letter from his son, who is a prisoner in Germany, the son had stated that they had been collecting "heather" for the Germans. We know of no use for heather and it is more than likely that it is the moss they are after for surgical dressings and other purposes. The use of this as an old woman's poultice has been known for ages, but its use in scientific surgery, so far as we know, has only come within the last few years.

Dr. W. S. Morrow: I would like to ask Dr. Porter with regard to the possible supply of this material here. I would also like to thank him personally for bringing the subject before us in this extremely interesting way.

Dr. W. H. P. Hill. I have had no practical experience in the use of this moss but in conversation with an officer in France, who had used it, I was told that it had all the merits and something more of absorbent cotton. Where they had used it as a pad for splints it was more resistant and you did not get thinning out and consequent pressure on the fracture or whatever it may be the pad was protecting.

Professor Porter: It is rather difficult to say what our Canadian supply amounts to. We have an infinite quantity of poor sphagnum. I have examined about sixty bogs in different parts of the country and spent the better part of a summer and autumn, and have only found one or two in upper Canada where it was worth gathering. I have not of course attempted to go far north, especially at this time of the year. Also it was not until six weeks ago, about the middle of October, that Colonel Hodgetts informed us that the material had been accepted as a standard surgical dressing by the War Office and until we got some assurance like that the Red Cross could not commit themselves to asking for any supply on a large scale. In Quebec I have succeeded in finding it in one bog, back of Rivière du Loup. I have examined bogs all along the Nova Scotia coast from south of Halifax up to the extreme end of Cape Breton Island. Every bog close to the sea has some patches of it but I have never found a place where one per cent. of the bog was good sphagnum. However, even one per cent. of a large bog is a lot of moss and I do not see any difficulty in getting as much as we need. I doubt whether it would amount to a commercial proposition, but with volunteer workers preparing it for use by our hospitals there should be sufficient to see us through the war at least.

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WAR NEPHRITIS

By Robert Dawson Rudolf, M.B.

Professor of Therapeutics in the University of Toronto

IN the present war there have been a large number of cases of nephritis which in several ways have been unusual.

Of course, wherever we get a great many individuals grouped together and they are carefully watched medically, there are bound to be a certain proportion of examples of inflammation of the kidneys seen, and such was the case during the first few months of the war. The writer was in charge of the Medical Division of a British general hospital in France in the winter of 1914-1915 and there were always a few cases of nephritis in the wards, but they were in no way peculiar. In the spring of 1915, however, examples of the disease became very common and during the summer they were so numerous as to attract special attention. In fact, so frequent did they become that a veritable epidemic of the disease might be said to have occurred. This epidemic continued all through last winter although in perhaps a slightly reduced form. It occurred in the German and Austrian armies in the same way as in ours.

A good deal has been written on this subject in the last few months and all agree in considering the disease to be peculiar in many ways, although probably few would go so far as the correspondent of the *British Medical Journal*, in France, who refers to it as a "new disease". (*Brit. Med. Jour.*, 1915, ii, p. 109.) Such epidemics have occurred before, notably during the American Civil War, but they do not necessarily occur in war, as is shown by the fact that the South African War was noted as being peculiarly free from the disease.

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The term "trench nephritis" has been commonly used to designate the condition, but, as our figures—as well as those of others—will show, the disease very commonly occurs in soldiers who have not been in the trenches at all. Probably a term less open to objection is the one at the head of this page, which was, I think, suggested by the *British Medical Journal* correspondent in France last January. The term "trench" has been used in connexion with nearly every disease that has occurred in this campaign, and usually with very insufficient reason. Probably the only good use of the word is in the disease called "trench foot".

This communication is founded upon the study of the two hundred cases of nephritis that occurred in a Canadian General Hospital in France during a year.* They form a part of the immense series upon which Sir John Rose Bradford reported in the *Quarterly Journal of Medicine* of last January. All cases of the disease occurring in France were as a military routine reported to him, and ours fully support all the findings that he records.

Ætiology. It is a common belief that nephritis is usually due to a "chill" but in the form of the disease under consideration this does not seem to be the case. Thus, during the first winter, when the condition of the trenches was at its worst and the soldiers were exposed for days on end to constant cold and wet—at the time indeed when the hospitals were largely busy with the care of thousands of cases of "trench feet"—cases of nephritis were uncommon. Then, just when the weather conditions were improving and the warm and comparatively dry climate of spring had come, they occurred in increasing numbers and this continued all through the summer. When, again, the winter had set in, although by this time the men were much more comfortable in the trenches—but still in surroundings of mud and rain that would horrify a civilian—the epidemic did not increase, but if anything lessened. So that, although believing as we do that a case of nephritis which is nearly well may be caused to relapse by a chill and should hence be kept for a long time in an equable temperature, it is evident that "chill" cannot be considered as a cause of the primary disease. Furthermore, if any additional evidence is necessary, our series shows that while the disease was rather more common in men who were serving in the trenches, still very many cases were soldiers who had not been in the trenches at all. Thus, of 192 cases 123 were from the trenches, but 69 were from the positions away from the trenches. Of course, this does not quite express the true proportion, as far more men are behind the trenches than in them, but still the number of cases that occurred away from the trenches is far too large a one to allow of the conclusion that the disease is in any way peculiar to trench life.

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*These two hundred cases were fully tabulated by the author in a detailed chart which was appended to this article. We regret that owing to its size this chart could not be published.—EDITOR.

Some of the cases (twelve in our series) give a history of previous renal trouble, but it is evident that the disease is usually a first attack. In several instances the patients had had a previous attack in France and had completely recovered only again to fall victims to the disease.

Age does not appear to be a predisposing cause in any way. The ages of our patients varied from seventeen to fifty-five, and while most of the cases occurred in young adult life this can be fully explained by the fact that most soldiers are of that age. Length of service and duration of service in France appear to have no bearing; many of our patients had only been a month or two in the country when they were attacked. Previous occupation and former diseases also seem to have no bearing.

As regards alcohol, 83 out of 152 of our cases gave a history of taking alcohol, but all were put under this heading who took any alcoholic drinks at all and most of them no doubt were moderate drinkers.

Very few of our patients gave a history of syphilis, but such records are of little value in soldiers. No Wassermann reactions were tried for, but Dr. Langdon Brown in a series of fifty-six cases of this nephritis found the reaction positive in 33 per cent., which is a much higher proportion, according to him, than prevails in the army generally. (*Lancet,* 1915, i, p. 391.)

The soldier's diet has been blamed for the disease, but although the protein element is high (180 grams) it cannot be the cause. It would act by producing an intestinal toxæmia and Mr. Mackenzie Wallis' observations (quoted by Dr. Langdon Brown) are definitely against such a toxæmia in these cases since he found neither an increase in the ethereal sulphates nor the presence of urobilin in the urine. That the diet is in some way to blame or is at least a contributing cause is rather suggested by the fact that the Indian troops in France are almost immune to the disease and yet their surroundings are in every way the same, but the diet is quite different. The German and French troops, as mentioned, are said to suffer in the same way as the British. The water supply has been suspected as being a cause, but this suspicion receives little support as the supply is from such various sources, is sometimes chlorinated and sometimes is not so. Some have suggested that the condition may be due to metallic poisoning from the large amount of tinned foods used, but no metal has been found in many samples of urine examined. Also, an apparently similar epidemic occurred among the American troops in the Civil War and probably there were few tinned foods used in those early days. I have not seen excessive use of tobacco suggested as a cause.

The epidemic nature of the disease would naturally suggest some infection as the underlying cause. Some have believed that this infection may be a suppressed scarlet fever, but it is impossible to believe that thousands of cases of suppressed scarlet fever could occur in the army without a much larger number of the ordinary type of this infection being present and such has not been the case. Again, no case of ordinary scarlet fever occurred among the staff in our nephritis wards so that one would have to admit of a non-contagious form of suppressed scarlet fever, which makes this theory still more unlikely.

A very interesting record is given by Dr. F. F. Chandler (*Lancet*, 1914, i, p. 461) of an epidemic of albuminuria which occurred in his battalion. Case after case came to him with slight fever and often herpes labialis and occasionally œdema. He found albuminuria in many. The cases usually soon cleared up but many were sent to the field ambulance and no doubt most of these reached a base hospital. He considered the epidemic to be one of influenza.

Sore throat is not a common antecedent of the disease. Bronchitis is very common, occurring in 86 per cent. of our cases, but it seemed to be rather an accompaniment than a cause of the disease. Again, Sir John Rose Bradford states that bronchitis is very common amongst the Indian troops and they have almost no nephritis.

Numerous attempts have been made to isolate an organism from the blood in these cases but with no certain results. Various bacteria have been occasionally recovered and grown but apparently nothing specific, and in the great majority of instances the blood cultures have been negative. It may be, as suggested by Dr. Langdon Brown, that the infection is of short duration and has generally disappeared by the time the patients have reached a hospital where it is possible to do such special work. Thus, in our cases the average time before the patients were admitted to our hospital was 9·6 days. No organism was recovered in a considerable number of cases in which blood cultures were made. Again, it has been suggested that a bacilluria may be the cause, but although occasionally a bacilluria is found to be present, usually it is absent. The type of nephritis present in the few fatal cases that have come to *sectio* has been both glomerular and tubal with some interstitial changes and white cell infiltration, all of which would suggest that the condition is due to an infection, but so far the nature of the infection has eluded investigation. The most constant infection that is present in soldiers is undoubtedly pyorrhœa alveolaris but I cannot say that this infection was more marked in our cases of nephritis than in any of the others. Still on the off chance of it being at least of some influence we had, during the last six months that I was in France, every nephritic patient subjected to dental treatment.

It has been suggested that the infection is ultramicroscopic, but so far the evidence of this is only of the negative kind, although it should be mentioned that Mr. Mackenzie Wallis was able to produce in rabbits a definite illness occurring eight days after the injections of urine prepared so as to be free from bacteria, but containing any filter passer present. The rabbits, however, did not suffer from nephritis.

Symptoms. All the classical symptoms of nephritis may occur in these cases but in rather different degrees from what they do in cases seen in civil life. We will take the symptoms in their order of frequency in our series.

1. Œdema. Œdema of the face occurred in 96·3 per cent. (184 out of 191 cases) and was very often the first thing noted. Frequently the history was that the patient had felt quite well until told by his fellows that his face was swollen. In many instances the œdema was so marked that the eyes were more or less closed. It always cleared up with great rapidity, although a good many cases had to be sent to England while it was still very evident.

Œdema of the body and limbs was noted in 89 per cent. (166 out of 187 cases) and was occasionally marked. In a few cases there was evident ascites and often some fluid in the pleuræ and œdema at the bases of the lungs. In no instance did the collection of fluid in a cavity require removal by mechanical means.

2. Headache was noted in 95·5 per cent. (182 out of 191) and was often severe. It was occasionally associated with considerable dimness of vision. In a few of the cases examined ophthalmoscopically retinal hæmorrhages were seen.

3. Nocturnal dyspnœa occurred in 78 per cent. (125 out of 160 cases) and often necessitated the patients being propped up in bed. A similar dyspnœa would also be noted in the daytime. As

regards the nature of this dyspnœa, Mr. Trevan (quoted by Dr. Langdon Brown) found the alveolar CO_2 normal in three and reduced in two from normal 5 to 3 per cent. "Since dyspnœa due to acidosis is always associated with reduction of alveolar CO_2 and uræmic dyspnœa is of this type, it would appear that the shortness of breath was not always associated with acidosis, uræmic or otherwise." It seems more probable that the condition is rather due to the œdema of the lungs, which is so constantly present.

4. Dyspnœa on exertion was present in 125 instances of the 160 cases in which this was noted (74 per cent.) but of course was a more indefinite symptom as it so much depends upon the amount of exertion and is a matter of history rather than of observation. Most of the patients were not in a condition upon arrival to permit of our trying for this symptom.

5. Cough and bronchitis were present in 76 per cent. (135 out of 177 cases) but were not usually severe enough to give rise to much distress. The sputum was nearly always free and watery. Signs of bronchitis were nearly always to be detected and frequently, as mentioned, many fine crepitations at the bases suggested œdema of the lungs.

6. A raised blood pressure was noted in 49 per cent. (77 out of 158 cases) of cases on admission. This refers only to cases in which the systolic pressure was 160 mm. and above. The diastolic pressure was noted as 100 mm. or above in 50 per cent. (77 out of 153 cases). Both the pressures were taken by the auscultatory method, the Tycos instrument being used. In some cases the pressure had fallen to normal in a few days. Dr. R. G. Abercromby (*Lancet*, 1916, i, p. 878) has noted the systolic pressure by the palpatory method in many cases and finds that it is always raised at some period; that it is higher in the afternoon than in the morning, and that as the patient improves it falls often by crisis. He states that the pressure usually diminishes *pari passu* with the amount of albumen, but not always. One would suspect that in those cases where the pressure does not fall as the albumen disappears we were rather dealing with cases of acute nephritis implanted on a chronic condition. We frequently noted that apparently the most toxic cases were not the ones that had the highest pressure. Thus five out of the twelve cases that had fits are noted as having a systolic pressure below 160 and in two instances it was respectively 120 mm. and 110 mm.

7. The aortic second sound was noted as being accentuated in 66 per cent. (87 out of 143 cases). It did not seem to be a neces-

sary accompaniment of high systolic pressure and in twenty-seven cases where it was noted as being present the pressure was less than 160 mm., while on the other hand in thirteen instances where the systolic pressure was 160 mm. or above, it is noted as being absent. This point we have often observed in civil practice.

8. The radial vessels were noted as thickened in 29 per cent. of cases (35 out of 121 instances).

9. There was more or less vomiting, either before entering the hospital or while there, in 35 per cent. of the cases (61 out of 174). Sometimes it was very persistent and there was also much nausea.

10. The quantity of urine in the twenty-four hours varied enormously, depending chiefly apparently on the stage of the disease. Many cases on admission had almost a complete suppression but in a few days a stage was reached in which the quantity would suddenly greatly increase and with the diuresis the œdema would rapidly disappear.

In some the twenty-four hour quantity was large even on first admission and here the stage of scanty urine was probably over before the patients reached us. In some this desired diuresis had not appeared before the patients were evacuated to England. Albumen was still present in the urine of 174 out of 188 cases on admission (nearly 93 per cent.). The ones in whom it was absent on admission were diagnosed by the presence of œdema, etc., and had come down the lines of communication with a diagnosis of nephritis and no doubt had had albumen at first. As regards the quantity, it is recorded on our list as large in seventy cases, moderate in fifty cases and small in fifty-four cases. In many cases it completely cleared up in a few days while in many it was still present when they were sent to England. There was no relation between the amount of albumen and the tendency to fits.

Renal casts, usually granular and hyaline, were noted in 70 per cent. of the cases. Sir John Rose Bradford, in his communication already referred to, only took the cases that had casts as undoubtedly nephritic, but in many of those in whom they were reported as absent in our series the diagnosis seemed quite likely from the presence of other signs, such as œdema and nocturnal dyspnœa, etc.

Red blood cells were noted as being present in 103 out of 177 cases (58 per cent.) and white blood cells in 46 per cent. (64 out of 138 cases).

In a very few instances blood was present in the urine to the extent of rendering this smoky or even red in colour.

11. There was often some fever on admission, the temperature being noted as 100° or above in 40·5 per cent. of the cases (74 out of 183), but it was never high. No acute complications such as pleurisy or pericarditis were noted.

12. Fits occurred in 6 per cent. of the patients after their admission to hospital (12 out of the 200 cases) and in several instances were very severe and the patients were more or less unconscious for hours. They all recovered.

A fatal issue occurred in only one case and here the post-mortem examination revealed typical granular contracted kidneys. This patient was thirty-six years of age and there was a history of previous kidney disease two and a half years before. He died in uræmic coma and did not have convulsions. The blood pressure on admission was 160-60 mm. and he had been on the sick list for forty days before he reached us. He had only been two months in France and had not been in the trenches at all. He was said to be a teetotaller.

Treatment. The routine treatment of our cases was as follows:

They were kept in bed between blankets in a ward which was carefully heated to between 60° and 65° Fahrenheit. The diet in all cases at first was "plain milk", which means six pints of milk in the twenty-four hours. Otherwise the fluids were restricted. In the slighter cases, and in all of them as they improved, the diet was soon supplemented, chiefly by the addition of bread and various vegetable foods.

A dose of one drachm of the compound jalap powder was usually given on admission and after that the bowels were kept freely open with concentrated salines. If any uræmic symptoms, such as vomiting, headaches or fits supervened, hot packs were freely used and they seemed to be of much value. Such hot packs necessitate a good deal of extra work and for this reason as well as with the object of guarding these patients against chills they were always segregated in a special ward, and here we had a larger staff of orderlies and nurses than in the average medical ward.

When suppression of urine was present dry cupping over the loins and then hot fomentations seemed useful.

Where fits occurred and they were severe, in addition to hot packs and extra purging, we bled the patients freely and this seemed to be very effectual in relieving the underlying toxæmia. As already mentioned, none of these cases died.

Pilocarpine was used occasionally to increase the sweating, and the saline diuretics were frequently given.

Prognosis. The ultimate prognosis of these cases could be better judged by the physicians whose care they came under after reaching England. Many of the slighter cases would clear up in a few days and, as said, some seemed to have already practically recovered before they reached the base. These slight and apparently recovered cases were often not sent to England at all in the summer, but to convalescent camps in France, and no doubt soon were returned to their units for full duty. But when the weather became cold and wet most of even the apparently recovered cases were evacuated to England.

CONCLUSIONS

1. The epidemic of nephritis which has occurred so generally amongst the European troops in the present war is peculiar in various ways and differs from the ordinary nephritis seen in civil life, (a) in its epidemicity, such epidemics have occurred in other campaigns, notably in the American Civil War, (b) in the low mortality in spite of frequent severe symptoms.
2. The disease appears to be due to some infection, local or general, the nature of which has not yet been determined, but probably it is of the ultramicroscopic variety.
3. Nocturnal dyspnœa is an early and very constant symptom far more so than in nephritis of the ordinary varieties.
4. The prognosis is much better than in acute nephritis of the ordinary types. The great majority of the cases soon clear up completely, but some drift into a chronic and persistent condition.

The cases in our series were under the immediate care of Captain (now Major) C. E. C. Cole; Major (now Lieut.-Colonel) A. J. Mackenzie and Major H. C. S. Elliot, and any value that this communication may have is chiefly due to their conscientious work as well as that in the Pathological Department of the hospital under Captains Duncan Graham, McKee, and Leeming.

ABDOMINAL WOUNDS AS SEEN AT A CASUALTY CLEARING STATION

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WHILE at our base hospital near and in Boulogne, sixty miles from the front, it was very infrequent to see cases of wounds of the abdomen coming in. By the time that we got to work in August, 1915, it was becoming the rule (it was far from being so in the first year of the war) to operate on abdominal cases; consequently such as came through to us had either been operated on, or if not, had been considered safe to let through, and appeared at our hospital two to six days after being hit, with secondary abscesses, or (very rarely), comparatively well. The real abdominal surgery in this war belongs to the casualty clearing stations. My own experience covered a service of close upon four months in one of these stations situated five to six miles or more behind the trenches: these were the first four months of 1916.

In order to gain a clear comprehension of the conditions under which the abdominal cases have to be treated, it will be necessary for the purposes of this paper, and perhaps not without interest to the members of the society, to describe briefly the conditions of evacuation from the trenches to the clearing station. The wounded are carried back by the regimental stretcher bearers down a communication trench to the battalion dressing station, perhaps some five hundred yards back, more or less. First aid is there given, and then, as soon as may be, the patient is transferred, first by horse ambulance, later by motor, direct to the casualty clearing station. For abdominal cases particularly, in which time was considered to be of the greatest moment, there was a standing order that whenever possible the wounded man should be immediately sent back to the casualty clearing station, even when other wounded were not ready to occupy the other three stretchers in the ambulance. Of course this was not always possible. The fre-

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quent necessity of evacuating during darkness, or a lack of sufficient ambulances during a rush, resulted sometimes in a delay of eight to twelve hours. However, in going over my records I find that the average time elapsing from the infliction of the injury to admission into the clearing hospital was from four to seven hours. In one case it was as low as two hours; in a few others it was as long as twelve; and in one case twenty-four hours.

In other respects also, the conditions of war are very different from those of peace. I think it may be said that trench fighting, while perhaps not often making any extraordinary call upon a man's muscular strength, does take it out of him most seriously in other ways, such as loss of sleep, exposure to cold and wet, the jolting of rough transport, with the consequent increase of pain, the length of the journey, the loss of blood; and all this must tell on the patient's resistance, especially, perhaps, in the case of wounds of the abdomen. As a result, the incidence of shock is very much greater than we are accustomed to see in civil practice. And when, further, one considers the nature of the wounds, inflicted as they are by fragments of shell from high explosives, and by bullets, both travelling at enormous speed, and therefore apt to produce in the intestines most extensive bursting and tearing wounds, it becomes still more comprehensible why the two factors of shock and hæmorrhage—but particularly of shock—should so often dominate the picture.

It is obvious that a certain proportion of the men suffering from abdominal injuries died on the field, or at the advanced dressing stations, from shock or from hæmorrhage. With the increase of the effort to get such cases back to hospital, the percentage of the desperate ones naturally rose; and during this past year, in contrast with the earlier part of the war, the casualty clearing stations had to cope with a larger number of moribund patients; the earliest results of abdominal work were rather better than the later ones, chiefly on this account. The latest results are again better, by reason of improved technique.

The lesions observed at operation varied from the comparatively light to the absolutely hopeless. For example, one of our patients entered with several feet of the bowel lying out upon the abdomen through a large torn wound; three of these coils were torn completely across, while inside there were several coils merely perforated, and one coil completely torn; there was a large amount of blood in the abdomen, and obviously a good deal had been lost externally, and a fair sized wound in the mesentery was found actively bleeding. In another case a bullet traversing from side to side, had made thirteen separate holes in the small bowel and the cæcum. Occasionally in addition there would be a wound of the spleen, or of the kidney, or of the bladder. The combined wounds of thorax and abdomen we learnt to put in a class by themselves. On the other hand there were cases in which the bowels seemed to escape as by a miracle. We had several with only one perforation of a coil; in two or three others there was free blood in the cavity but no wound of the bowel. It is now thoroughly well established that there may be penetration of the abdominal cavity, even perforation, without visceral wound; and on the other hand that there may be wounds of the abdominal wall not penetrating the peritoneum but causing bleeding into the cavity and even rupture of the bowel. This is probably due to the lateral radiation of violence from the passage of a high velocity missile.

There are a few principles, or rather generalizations, which we were gradually able to form, and which have been also found to be valid by other surgeons with much larger experience than our own, particularly Cuthbert Wallace. For instance, wounds in the epigastric and hypochondriac regions from front to back, and particularly those on the right side presumably involving the liver, are apt to be of favourable prognosis, and operation can often be omitted. An exception to this concerns the wounds of the midline in which the large vessels may be hit. These are remarkable by their absence in the casualty clearing station, and the victims of such wounds presumably die on the field. Wounds of this region, however, from side to side, are rather apt to be fatal. Wounds in the hypogastric region are much more serious than those higher up, possibly because of the greater danger of injuries to the colon. Wounds of the buttocks going through the abdomen we learnt to fear very much; the reason possibly is that for a fragment to penetrate this region and enter the abdomen it is obvious that it must be travelling at a high rate of speed, and consequently is apt to produce very extensive lesions inside. On the whole wounds passing from side to side are more serious than those from front to back. When the missile had penetrated both chest and abdomen one had to deal simultaneously with a hæmothorax, often causing severe dyspnœa, and a probable wound of the abdominal viscera. In such cases we at first operated regularly, but the results were so bad that we ultimately came to the conclusion that they were better left alone, and later experience showed that of such cases a much higher percentage recovered when not touched than when operated on.

A special word should be said concerning hæmorrhage. Nearly all the cases showed some blood free in the abdomen, and most of the serious ones showed a large amount, so much so that it was frequently difficult to distinguish what part was played by hæmorrhage, and what by shock in accounting for the gravity of the patient's condition. Ordinarily one could find the source of the bleeding in a vessel of the mesentery. In one case upon delivering the intestines a large vessel was found spouting twelve hours after the injury. It was obvious that it must have stopped long before, and then recommenced upon the manipulation of operation, for the amount present in the abdomen was not more than forty to fifty ounces. This patient's blood pressure, by the way, was normal, 125 mm. Doubtless in many cases the mesenteric bleeding stops of itself. The amount of blood present in the abdomen was sometimes of course, very large; it would spurt out under tension, and flow out as if there were no end to it, giving one a feeling of desperation if there were any difficulty in finding the point of origin. But as a matter of fact it was frequently found that bleeding was not actively going on, and that the continually flowing blood was merely that which had already been effused. At post mortem in two cases in which no operation was done, I measured the amount thrown out into the cavity; in both the condition was such as is described by saying that the abdomen was "full of blood"; the amount in one case was about forty ounces, and in the other was somewhat over fifty ounces. While most of the patients in which such an amount of blood was effused showed the evidences of shock, some did not, and I thought I could conclude that few patients died of hæmorrhage alone, although undoubtedly the loss of blood contributed to the gravity of the shock already present.

The mention of shock brings me to what I think we must consider as the great cause of death in cases dying within the first twenty-four to thirty-six hours. Out of twenty-nine cases of injury to the gut of which I have analyzed the records, I find shock present in nineteen, in fourteen of which it was of severe degree. Shock of very severe grade was present in seven, all of whom died within the limits of three to twenty-two hours after operation. In all of these the pulse was very feeble or absent, the temperature would not register above 92°, the low point in our clinical thermometer, and the blood pressure was always below 80 systolic and 50 to 60 diastolic. The instances in which a man recovered with a blood pressure before operation of under 75, and a temperature below 94°, are extraordinarily rare; I do not think that one of our series recovered, and the total of the series observed during my service was forty-three, including only cases in which the peritoneal cavity was entered by the missile. A low temperature of 94° or over, or a blood pressure of 75, might come up within the first few hours and then the patient would stand operation, though he might still die within twenty-four hours of shock, or live two or three days in other cases; but if the temperature and blood pressure showed no sign of rallying, operation was never followed even by a temporary rally. I shall speak further under the heading of treatment, on this question of operation during shock.

The clinical findings present some points of interest. It was, for instance, the rule in the Field Ambulance to give all patients ½-gr. of morphine hypodermically, and upon arrival at the casualty clearing station a ¼-gr. was frequently again given. Morphine has been used with extraordinary freedom in the war, and on the whole with the best results. However, it cannot be said that it sufficed to prevent, or even to alleviate, the serious effects of shock in the bad abdominal wounds. Doubtless it helped to prevent peristalsis and the exit of fæces into the peritoneum; doubtless it saved pain, but I could not observe that it ultimately saved life, if bad shock were present from the general wound. Distension before operation in the cases seen by us was usually remarkable by its absence; occasionally it was moderate, but never great. Respiratory movements were nearly always much limited or abolished, but this was from pain, not from peritonitis. Pain and tenderness in spite of the morphine were usually quite marked; muscular resistance and rigidity were also usually present, but never to the extent which we see in the peritonitis of civilian work. It might be thought that in conditions in which the bowels were perforated as a rule, percussion would show the evidence of free gas in the cavity; that was found rarely to be the case. I can remember only two or three instances in which the liver dulness, for instance, was obliterated, and only one in which a peculiar tympanitic note over the liver gave rise to the certitude that free gas was present. In that case on incising the peritoneum the gas came out under tension. A wound of the stomach was practically always betrayed by vomiting of blood, or of the bladder by the presence of blood in the urine.

I have already described in part the nature of the lesions found at operation. It is comprehensible that at times the difficulties of the operation were very considerable, and the danger of overlooking lesions not small. In a patient whose vitality was already low from shock and hæmorrhage, it was often a matter of great difficulty to judge how much one should do, whether to explore further and make certain, or to chance overlooking a hole in order to spare operative shock. Here, too, experience taught us gradually what to do and what not to do. I was still grieving over mistakes when I had to leave the casualty clearing station and return to Base, but they were not those of missing lesions which happened only three times. I overlooked in one case a bad wound of the kidney and a tear on the under surface of the transverse colon above the transverse mesocolon; in another I overlooked a wound of the rectum deep in the hollow of the sacrum; and in another a wound of the third portion of the duodenum, the bullet having entered from the loin on the left side. Death, however, was not due, as we found, to overlooking such things. Except in one instance it was due to the original injury and the shock.

Wounds of the liver varied a great deal in severity. A high velocity wound would cause very extensive necrosis of tissue outside its proper track, whereas a low velocity one would frequently be borne by the patient without trouble. Bleeding from liver wounds was frequently surprisingly small, but it was found by men in Base hospitals that the later results of liver wounds were apt to be worse than one had anticipated; abscesses were quite frequent.

It was interesting to find that even after the most extensive wounds of the bowel the amount of fæcal soiling of the peritoneum was nearly always minimal. I can only remember three or four cases out of the forty-three in which there was free exit of intestinal contents. This was true even in the patient who was operated on twenty-four hours after injury. The shock of the injury doubtless paralyzes immediately the movements of the bowel, and the later exhibition of a large dose of morphine continues that effect. In a few cases there was very slight local soiling, but in the great majority the peritoneum was clean, except for a slight plastic or fluid exudate, and blood. In one case of perforation of the stomach there was an escape of blood and mucous from the entrance wound in the left loin, but in several other cases there was no escape of stomach contents whatever. Thus the necessity of early operation on account of the danger of peritonitis, which at the beginning we thought was imperative, we later concluded not to be so. This brings us to a consideration of the principles of operation.

First, as to the incision, its situation was determined, of course, often by the situation of the wound, or wounds; but as a general thing it was a vertical one in or near the middle line. There were two methods with regard to the incision which we tried out.

The one was a short, that is, a four inch incision, permitting only the peeling out and in of the bowel through most of its length. The other was a rather longer incision with immediate evisceration of the bowels in mass. The former guaranteed better against operative shock; the latter permitted quicker finding and estimation of the damage. I will only say that we ultimately decided that the shorter incision was the better. It usually sufficed to find all the lesions, and there was no doubt that evisceration was much more apt to cause death from operative shock, and also much more apt to cause paralytic ileus.

We found it best, as advised by Meyer and Taylor, to complete the examination of the gut at the beginning, putting a clamp on the wounded areas of the bowel and going on to examine the rest, so that at the end we might have several clamps on parts of the bowel separated by many feet. If one proceeded to suture holes as found, it would be discovered later that the resection of a coil bearing several perforations would have been shorter and easier. The work to be done included anything from inturning one or two small perforations on the convexity of a coil, up to two resections of one or two feet of bowel, plus suturing of numerous holes, plus perhaps packing a spleen or kidney, and tying a bleeding mesenteric artery. Our experience was that the old end-to-end suture was the quickest method of union, and quite satisfactory; quicker than closing both ends and doing a lateral union, and not productive of any greater shock. In no case did there occur leaks along the suture line. In all cases it was found advisable to put a drain to the pelvis; the effused blood was always potentially infected. Blood was generally mopped out with sponges. Irrigation was discarded after a few trials. Peritonitis after operation was not frequent as the cause of death, that was due most often to shock or ileus. We kept blood pressure records as regularly as possible.

The plan of procedure advised by the surgical consultants was that operation was indicated always, excepting when it seemed reasonable to conclude that the bowel was not injured. The condition of shock was to be combatted by rest, the application of heat and intravenous salt solution, over a period of two or three hours, after which, whether the patient had rallied or not, operation should be done, in order, as it was put, to give him his chance. Obviously, if he had rallied even partially, it was assumed to be better to interfere in order to forestall peritonitis, or to stop bleeding assumed to be perhaps going on; while if he had not rallied he was certain to die without operation, and therefore operation ought to be done. While we doubted the wisdom of this course in cases showing no rally, we nevertheless followed out these instructions, feeling that our lack of experience ought to forbid too much dogmatism in private judgement; but before the end of the service at the clearing hospital it seemed justifiable to conclude that on the whole, when a patient was in a condition of serious, or even moderate shock, it was better to delay operation even for seven or eight hours if necessary, while waiting for a rally as evidenced in rise of blood pressure and rise of temperature, even at the risk of peritonitis or bleeding. I feel confident that some patients succumbed to the shock of operation added to the shock of the injury. In talking with other surgeons concerning this question, the opinion was expressed that operation had practically never saved a man in whom the pulse was flickering or could not be felt. This was said by one in particular whose results were the best in our region.

Another frequent cause of death was paralytic ileus. The patient would survive the operation, and appear to be doing fairly well for two or three days; but gradually distension would come on, and nothing could be got to pass the bowels; then would appear vomiting and the drawn, haggard countenance, with gradually increasing pulse rate and falling blood pressure. This condition usually led to death inside of two to four days. In two cases I carried out a jejunostomy high up in the bowel, and in one I joined the dilated small bowel to the transverse colon, but without succeeding in saving the patient in any instance, although in the two cases of jejunostomy vomiting ceased. Enemas seemed to be of no avail. With regard to pituitrin a special word should be said. Some surgeons found it extremely valuable, and declared that it did not often fail in stimulating peristalsis. My own experience seemed to show that it was very rarely of any use; but I am ashamed to confess that I was for some time unaware of the fact that, to obtain a peristaltic effect, pituitrin ought to be given into the muscle or the vein and not subcutaneously. Captain Taylor who found it most successful was particular to give the hypodermic with his own hands, and make sure that the drug was given into the muscle. Since employing it in this way I have changed my opinion, and now believe that pituitrin is a valuable help. Before I left we were able to certify to the fact that it was at times apparently a life saver in overcoming bowel atony; and I believe that my results would have been better if I had used it properly from the start.

Peritonitis as the cause of death was found in very few of the cases. It is very possible that more would have died of this complication if shock and ileus had not carried off so many in the early days; still it was remarkable at post mortem to find so infrequently any evidence of advancing inflammation.

As to the results; in a series of thirty-seven cases operated on we secured thirteen recoveries, which makes a recovery rate of 35 per cent. From my conversations with some half dozen other surgeons up and down the Front, it seemed clear that the average results obtained were between 30 and 40 per cent. recoveries. Captain Taylor, however, reports as high as 50 per cent. in a series of some eighty-odd cases. Oddly enough he was in a district in which the average time from the trenches to the hospital was longer than almost anywhere else. Paradoxical as it may sound, I cannot help believing that the circumstances of a longish journey back are rather in the surgeon's favour. The very bad cases are apt not to arrive at the hospital at all, and when they do arrive, the length of time elapsing may possibly be of advantage in allowing some rally from shock. On the whole, however, with increased experience both in technique and in anæsthesia, and increased knowledge in judgement (particularly as to what cases are entirely hopeless and excluding these), the results are becoming steadily better. Rutherford Morrison, whose work has been at base in England, has asserted that a recovery rate of 60 per cent. ought easily to be obtained. But those who have had to do the work are better able to judge than Morrison, and they know that such results can only be secured by a rigidity of selection so great as to amount to real inhumanity.

In conclusion, it is a pleasure to acknowledge the great help afforded in the observation and treatment of these cases by Captain W. L. Maclean, assistant surgical specialist to the Casualty Clearing Station.

NOTES ON WAR SURGERY

By Captain Donald Hingston, C.A.M.C.

MY share in this evening's programme is to bring forward some brief notes on the wounds received in the present war, their general characters, and their treatment. It can be safely said that this war has introduced nothing radically new in the pathology, nor in the treatment of wounds. Conditions of war surgery differ from conditions of civil surgery, but the difference is not of principle but of detail and of degree.

The difference lies first, in the nature and the multiplicity of the wounds; secondly, in the severity of the infection; and, in the third place, in the wonderful recuperative power of picked young men wounded while at the height of their splendid health. If, on the one hand the infections are more virulent and the injuries more severe, on the other hand the recovery is far more rapid than that of a patient in civil surgical practice.

Wounds in this war are roughly classified according to their cause into *bayonet*, *gun-shot* and *shrapnel* wounds. Of course, there are besides these, fractures, dislocations, bruises, burns, etc., which the soldiers receive from falls, from being buried or burnt by shell explosions, but these are comparatively infrequent, and of no special clinical interest.

Bayonet wounds are rare. The soldier is taught to strike at vital points, the neck, or the abdomen, and the thrust is usually fatal. During the first year of its work in France, No. 3 Canadian General Hospital received but one man suffering from the wound of a German bayonet.

The German bullet is smaller but speedier than that used by any of the Allies. It weighs 154·5 grains and has a muzzle velocity of 2882 feet a second when fired from their Mauser rifle. At fairly close range it will pass through the body with a small punctured wound of entry and an almost equally small wound of exit.

Under *shrapnel* wounds are classed wounds from shrapnel shells, high explosive shells, hand grenades, rifle grenades, trench

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mortars and all other explosive shells. Men suffering from wounds of this class form the great majority of the patients in the surgical wards of the military hospitals. The foreign bodies may be large or small, the wounds may be deep or comparatively superficial, they may be simple or multiple. One patient in our hospital showed eighty foreign bodies on *x*-ray examination.

The second point of difference between war and civil surgery is the nature and severity of the infections. With the exception of a small number of bullet wounds we can say that all wounds are infected. The nature of the infection varies principally with the length of time that has elapsed since the wound has been received. At first of a milder type, it rapidly becomes more foul and more virulent. This is especially the case if the wound is deep and the foreign body large and particularly if shreds of clothing have been carried into the wound.

The number of various organisms isolated from wounds by bacteriologists during this war is very great. They vary from the mild infection to the most virulent. Anærobic and ærobic, saprophytic and parasitic all have been found. As a French bacteriologist sums it up, "the flora of the wounds corresponds to the flora of the soil and the flora of the intestines."

Preëminent in severity among the infections with which we had to deal was that known as "gas infection". This infection is caused by one or more of a group of gas-forming, putrefactive, saprophytic bacteria of which the *B. Perfringens,* also known as the *B. Ærogenes Capsulatus* of Welch, is the one most frequently found. The severity of this infection is hard to exaggerate. As a rule it begins insidiously, in some recess or pocket which has not a thorough drainage and in which necrotic tissue lies. The patient may complain of increased pain but for some hours there are no definite symptoms. Usually there is a sudden collapse which often is the first warning we receive of this dreaded infection. Preceded by a zone of attrition and devitalization of the tissues, due to the toxines of the infecting organisms, the disease spreads with a speed hard to realize unless one has seen it. In a short time there is present, besides the filthy odour of putrefaction a special sour smell characteristic of the infection, The diseased area rapidly becomes tympanitic on percussion and crepitant to the touch, toxæmia progresses and in a few hours the patient dies. Usually clear mental powers are preserved till a few moments before death. The infection spreads still more rapidly after death. At autopsies, which must not be delayed, the body is bloated and inflammable gas fills the abdominal cavity. Even the heart, arteries and liver are full of the same bubbling gas. Although gas infection is not necessarily fatal this is a fair picture of many an unfortunate case in our military hospitals.

As regards the recuperative power of the wounded little need be said. Young men in the finest possible condition of health, they possessed extraordinary resistance and their wounds healed fast. Of 8,591 cases, medical and surgical, admitted to our hospital up to May, 1916, seventy-three died. The mortality was thus 0·89 per cent. During the same period we had thirty-eight deaths following 1,593 operations, a post-operative mortality of 2·38 per cent. Such results would be hardly possible unless the patients were in a physical condition better than is met with in city hospitals.

The following case is of interest as it shows with what speed infections may develop.

F. S., private, 1st East Yorks, admitted to A Ward, No. 3 Canadian General Hospital, August 10th, 1915. On August 9th at 2 p.m. he was struck in left buttock by fragments of shrapnel. He received anti-tetanic serum at the dressing station where his wound was dressed. He then walked two miles to the train. During the night the wound became acutely painful. On examination the following day at noon, twenty-two hours after the wound had been received, we found a jagged perforating wound. *X*-ray examination showed one large and two small fragments of shell-casing. There was a foul-smelling, bubbling discharge. Smears were taken and *B. Ærogenes Capsulatus* and *B. Tetanus* found. Immediate operation was performed by Major Hill who removed the large fragment and established very free drainage. There was a steady improvement and the patient was discharged almost well on September 5th.

The general treatment of wounds has varied to some extent during this war. In the first few months influenced largely by Delorme, ultra-conservative methods were followed. The tendency was to leave as many cases as possible without operative interference of any kind. Experience, however, has shown that by far the safest course lay in following well-tried rules of surgery. It is now generally admitted that foreign bodies lying in infected wounds should be removed, but exception may be made if the foreign bodies are very small. The most important feature of good surgical treatment is the provision of absolutely thorough drainage. In practically all the cases we had that died of gas infection or other septic infections, post-mortem examination revealed some pocket not drained or at least not sufficiently drained. It is worthy of note that most of our severe infections, especially the gas infections, originated in wounds of the thigh, inguinal region or buttocks. The reason of this lies in the fact that thorough drainage in this area is difficult. The long intermuscular planes filled by loose connective tissue offer channels along which the infection creeps unnoticed and pocketing ensues.

When dealing with an ordinary infected wound caused by shrapnel or any other kind of explosive shell the foreign body should be removed. It is then imperative that either the wound be excised or that adequate drainage be supplied. Excision gives excellent results but this form of treatment should be left exclusively to surgeons of experience as there is danger of overdoing it and increasing the severity of the wound. So it is upon good drainage that we principally must rely.

As dressing for infected wounds two solutions have been widely used. These are Dakin's and Wright's. Dakin's solution, prepared by a simplified method and used in the British hospitals under the name of "Eusol", consists of chloride of lime (bleaching powder), boric acid and water. The proportions are 12·5 grammes of chloride of lime, 12·5 grammes of boric acid to the litre of water. This solution contains ·5 per cent. free hypochlorous acid. It has proved an excellent antiseptic especially in foul saprophytic infections and is the most widely used of all solutions in the military hospitals. Carrel uses Dakin's solution in his treatment of infected wounds. His treatment consists in introducing a perforated, soft rubber tube to the bottom of the wound. This tube may be single or branching and varies in size, shape and length to suit the various wounds. By means of this tube the cavity is gently flushed at frequent intervals with the solution. The wound is not laid widely open nor is dependent drainage established. He reports that there occurs a rapid disinfection of the wound which on becoming aseptic may be closed by suture. At No. 3 Canadian General Hospital we did not attempt Carrel's treatment. It would hardly be practical in a hospital where the personnel was so small compared with so large a number of patients.

Wright's hypertonic method consists in using a salt solution more concentrated than normal saline. The solution he recommends is one of 5 per cent., to which he adds a small quantity of citrate of soda to impede coagulation. When this dressing is used there occurs a strong osmotic current bringing serum from the body into the wound. This serum has powerful bacteriocidal action. Personally I prefer it to the hypochlorous acid treatment and base my opinion on having tried both solutions on the same patients on alternate days, on having watched the results on having enquired from the patients which dressing gave them the greater comfort.

SUBACUTE COMBINED SCLEROSIS

By Gordon S. Mundie, B.A., M.D.

and

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THE very early symptoms associated with chronic diseases form one of the most interesting chapters in medical diagnosis, and the possibility of establishing a diagnosis at an early stage of any disease forms one of the most important duties of a practitioner.

Subacute combined sclerosis, as a disease entity, has now been recognized for some years, and its association with pernicious anæmia, more particularly, has been made the subject of many interesting communications. It has, however, been insufficiently recognized with what frequency this disease is associated with all forms of intoxication (whatever that term may imply), and particularly with many forms of secondary anæmia, other than the pernicious type.

The practitioner of medicine is confronted, so often, with ill-defined symptoms, indefinite paræsthesias, muscular weakness of the extremities, etc., conditions which are very frequently put down to a mere functional disorder, only to be found after many months to be due to a serious lesion of the central nervous system. While neurologists have already long recognized the frequency of this disease, it does not seem that practitioners in general are aware that, with greater frequency, this disease is being detected, since more attention has been drawn to the subject, and since methods of examination in nervous diseases have become more thorough. Every patient with a secondary anæmia should be examined for symptoms and signs of subacute combined sclerosis, and there is little doubt that we shall in that way get a much more reliable idea of its great prevalence.

In this paper we wish to present seven cases which we consider characteristic of the disease, and which we have chosen out of the

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cases we have seen during the last two years, either in private practice or in the public wards of the Royal Victoria Hospital. At this point we wish to express our thanks to Drs. Martin and Hamilton through whose courtesy we examined some of the patients. For the sake of brevity in the case reports we have omitted all negative points.

Case No. 1.—Male, age fifty-two, clerk, single. Admitted to the Royal Victoria Hospital March 8th, 1915, complaining of weakness of the legs and constipation. He says that one evening in February, 1914, he had a slight chill. Six days later he had severe pain in the right knee and leg associated with some swelling, redness and tenderness but no fever; slightest movement caused pain. After two weeks in bed with the use of salicylates, aspirin and colchicum he recovered. During the summer of 1914 he did not feel right; no lameness but there was a heaviness in the right leg; at times, especially in cold and wet weather, there would be some stiffness and soreness in the leg. Early in January, 1915, he was exposed to the wet and cold and had a slight chill, had to quit work and go home with a severe pain in the left leg from the knee down; leg was tender and swollen and the condition was not relieved by the use of salicylates. Two weeks later was seized with a similar pain in the right leg and over the same area as in the left leg. From this he has gradually recovered but cannot walk yet without crutches. During the last two weeks he has had some stiffness in both legs from the knees up to the lower part of the abdomen but no actual pain. He has been troubled, more or less, with constipation since last autumn. No bladder disturbances. The personal history, apart from "rheumatism" for seventeen years and hæmorrhoids for fifteen years, is negative. Denies venereal infection.

Physical Examination.—Well nourished, anæmic-looking man, younger than he looks. Teeth are composed mainly of bridge work, only slight pyorrhœa. Pupils are normal. The movements of the right leg are weaker than those of the left. Incoördination in doing the heel-knee test, more marked in the right leg. Marked Rombergism; gait is ataxic. No loss of tactile, painful, or thermic sensation, but some loss of joint-sense in the toes. The reflexes are brisk in the arms, epigastric and abdominal are active, knee jerks brisk, ankle jerks active, and there is a double extensor plantar response. The patient seems to have difficulty in expelling the contents of the rectum. The Wassermann test on the blood and cerebro-spinal fluid was negative; no increase of globulin and no increase of cells in the cerebro-spinal fluid. The blood examination showed 2,750,000 red cells, hæmoglobin, 58 per cent., with considerable poikilocytosis but no nucleated reds. The patient was put on sodium cacodylate hypo, and given walking exercises. On March 17th, 1915, examination showed 3,730,000 red cells, hæmoglobin, 58 per cent., considerable poikilocytosis but no nucleated reds. On April 16th there was very little improvement in the coördination of his leg movements and he walked poorly; blood examination showed 3,900,000 red cells, 78 per cent. hæmoglobin with poikilocytosis but no nucleated reds. He was discharged April 17th, 1915.

Case No. 2.—Female, age forty-five, married. Admitted to Royal Victoria Hospital August 12th, 1915, complaining of numbness of the legs and inability to walk. Her illness began indefinitely two years ago with a feeling of weakness and numbness in the legs; the weakness was especially noticeable in climbing stairs. After sitting for a short time her legs would feel numb and this numbness has gradually increased. Nine months ago, while in the hospital, she noticed that she did not feel the nurse rubbing her heels. Four months ago had a severe nose bleed which lasted two hours. Four months ago began to have cramps in the calves of the legs and twitching of the muscles. Has had several severe falls owing to inability to balance herself. Three months ago had another nose bleed but not so severe as the first. The numbness is becoming worse, her feet feel like rubber and when she walks it is like walking on thick rubber pads. She has often dropped objects from her hands. She suffered from constipation and headaches. Two months ago began to have the sensation of pressure around the abdomen and costal margin which was not relieved by removing clothes. Has had attacks of a burning sensation in the feet for eight weeks.

Physical Examination.—Fairly well nourished woman, good colour, teeth in very poor condition, considerable pyorrhœa. General wasting over the whole body. All limbs are spastic but most marked in the legs. Marked ataxia in the arms and legs. Considerable loss to touch, pain and thermic sensation over the whole body and marked loss of joint sense in the hands and feet. Patient felt no pain when lumbar and venepuncture was done. Reflexes of the arms are brisk; epigastric and abdominal reflexes are absent; knee and ankle jerks are very brisk; unsustained ankle and rectus clonus; Hoffmann's reflex is positive in both hands and there is a double extensor plantar response. Marked Rombergism, very ataxic and unable to walk without assistance owing to the ataxia and spasticity. Wassermann test on the blood and on cerebro-spinal-fluid was negative, and no increase of globulin or cells in the cerebro-spinal fluid. Blood examination showed 3,040,000 red cells, 70 per cent. hæmoglobin, no poikilocytosis, and no nucleated reds. Patient was discharged August 25th, 1915, unimproved.

Case No. 3.—Male, age fifty-six, widower, merchant. Complaining of constipation and "rheumatism" in knees and calves of legs. About eight years ago, without any cause, began to have attacks of diarrhœa twice a month; he would have as many as twenty liquid stools in a day, sometimes painful, with or without mucous and blood. An attack would usually last only a few days but has been as long as ten days; at this time it was thought he had typhoid fever. This diarrhœa alternating with periods of normality continued until eighteen months ago. At that time he was operated on for a cyst of the buttock and since this operation he has been constipated; he will go several days without a movement when one dram of cascara will cause a movement, but he thinks his lower bowel is paralyzed because he has no feeling when the desire to empty the bowel comes, and if he did not rush to the lavatory he would soil his clothes. The constipation has gradually become worse. About the time of the onset of the constipation he began to have a tired feeling, even when doing very little. He has gradually become worse until now he frequently finds it difficult to walk. For years he has had weak knees and a sensation of lack of feeling in them. Lately he has become pale. No headaches. Memory has failed a great deal. Frequent micturition for three or four years.

Personal History.—He had gonorrhœa thirty years ago.

Physical Examination.—Well nourished but poorly developed man of a florid complexion. Mentally he loses the trend of the conversation very easily and is very slow. Pupils are normal; slightly nystagmoid jerkings. Motor power is fair, compatible with general wasting. Some ataxia of the hands but it is quite pronounced in the legs. Very slight patchy loss to touch in legs but none to pain. Very slight loss of joint sense in the hands but quite marked in the feet. All the arm jerks are diminished; epigastric and abdominal reflexes are active; left knee jerk is obtained with reinforcement but the right is absent; double plantar flexor response; marked Rombergism but no spasticity. Some difficulty in controlling the bowels. Wassermann test of the blood and cerebro-spinal fluid was negative and no increase of globulin or cells. Blood examination showed 2,750,000 red cells, 71 per cent. hæmoglobin and slight poikilocytosis. He was discharged October 21st and died at home December 22nd, 1915.

Case No. 4.—Female, age twenty-nine, single, teacher. Admitted May 1st, 1916, complaining of stiffness and numbness in legs and arms, cold extremities and lack of energy. Patient has been feeling below par for four or five years; at first she did not work with her usual vim, also was nervous and excitable. At times would feel quite well. This condition continued until about sixteen months ago when she began to be troubled with numbness of her hands and feet and a sensation of always being cold.

She was worse in the cold weather. Conditions gradually grew worse until January, 1916, when she had a severe attack of influenza for one month. She vomited off and on for two weeks immediately after each meal, no pain, no blood. Regained her strength slowly and while at home seemed to be doing well but on returning to work, her strength failed, she became depressed, crying occasionally and taking no interest in anything. Her appetite was good until a month ago when it began to fail and her strength seemed to go rapidly. For two years has had a profuse brownish pigmentation of the face. About Christmas, 1915, began to have some difficulty in placing her feet; they were heavy to lift and it required a good deal of effort to walk about; going upstairs was difficult but coming downstairs or hills seemed to be even more so and on many occasions she had severe falls. Rest did not improve her condition and since April 1st has been worse; has lost about eight pounds.

Physical Examination.—Pale, thin, poorly nourished, asthenic mentally and physically; marked pallor of the mucous membranes. General motor weakness with slight spasticity of the legs. Ataxia of the arms and legs. There is some loss to touch all over the body and a band of anæsthesia around the body at the fourth and fifth dorsal segments, more marked on the right side. No loss to painful or thermic sensations. Loss of joint sense in the right hand and left foot. Arm reflexes are active; epigastric and abdominal are brisk; knee and ankle jerks are brisk with a double extensor plantar response. She is unable to walk without assistance. Blood examination showed 2,400,000 red cells, 65 per cent. hæmoglobin with marked anisocytosis but no poikilocytosis, no nucleated reds. Wassermann test on the blood was negative but a lumbar puncture was not done. Patient was given massage, with arsenic and iron but very little improved. She is still alive and from reports received is in about the same condition.

Case No. 5.—Referred to me by Dr. Enright. Male, age thirty-eight, tailor, married. Admitted July 6th, 1916, complaining of weakness and difficulty in walking. Was perfectly well until Christmas, 1915, when he developed a stiffness in both knees and the left ankle, then in both large toes which was accompanied by a sensation of burning in toes and soles of the feet and a fluttering or throbbing over the outer side of the leg from the ankle to the knee. Next, the tendons behind the knee felt shortened and his knees seemed to be swollen but were not. This condition progressed gradually until six weeks ago when legs began to become weak and at the same time he had increased difficulty in defæcation. The weakness progressed until, one week ago, his legs became useless and he had to be brought to the hospital in a cab. Since admission the pain and burning sensation in the legs have increased.

Physical Examination.—Small, fairly nourished man of a very fair complexion, with an irregular mottled pigmentation over the forehead and neck. Teeth are in very bad condition. General wasting, muscles are flabby, slight spasticity of the legs; marked ataxia of arms and legs; no fibrillary twitchings but legs jerk at times. Indefinite loss to touch and pain in legs and trunk, marked loss of joint sense in toes. Arm, epigastric and abdominal reflexes are brisk; knee jerks are brisk while the ankle jerks are absent and there is a double extensor plantar response. Marked Rombergism and very ataxic in walking. Wassermann test on the blood and cerebro-spinal fluid was negative and no increase of globulin or cells. Blood examination showed 3,680,000 red cells, 90 per cent. hæmoglobin. While in the hospital under treatment the number of red cells increased to 4,250,000. He developed retention of urine followed by incontinence of urine and fæces; at times he was irrational. On September 5th, 1916, he was discharged on his wife's request and died soon afterwards.

Case No. 6.—Female, age fifty-nine, married. Admitted August 27th, 1916, complaining of headache and sick in the stomach after each meal for two months. Illness began with headache—although she has had headaches since childhood—last winter; chiefly at back of neck and frontal region. The gait has been unsteady for eighteen months and she thinks she fell downstairs and injured her back as a result of this unsteadiness. Previously to this she used to fall off the edge of the sidewalk. More recently has been unable to walk in the dark. Her fingers have been clumsy lately, has been unable to button her clothes so well. She is dizzy on doing any sudden movement. For two years has had, off and on, indefinite sharp shooting pains in the legs, back and elsewhere; also tingling sensations in the fingers and feet. The amount of urine voided has varied a great deal but has often been delayed and in an interrupted stream; bowels have been regular.

Physical Examination.—Memory is very poor, at times cannot remember her own name. General weakness, no energy, ataxia is fairly well marked in arms and legs. Slight loss to touch in legs and loss of joint sense in hands but not in the feet. Arm jerks are active on the right but absent on the left, epigastric and abdominal reflexes are active; knee jerks are very brisk but ankle jerks are absent; double flexor plantar response; marked Rombergism. Blood examination showed 3,500,000 red cells; 80 per cent. hæmoglobin. Wassermann and colloidal gold tests on the cerebro-spinal fluid, which was under pressure, were negative and no increase of globulin or cells.

CASE No. 7.—Female, age forty-five, single, milliner, referred to me by Dr. Lauterman. Complains of trembling of the body and difficulty in walking. Illness began about July, 1915, when she had queer sensations in her knees, as if they did not belong to her, and also her ankles would give way easily while she had trouble in going upstairs. She would tire out easily. Gradually the walking has become worse until now the legs are very stiff and she has to pull herself upstairs with her hands. There is numbness in the soles of her feet and ankles and a feeling of a tight band around the abdomen. Since June has had difficulty in walking in the dark and in controlling bladder and bowel movements.

Physical Examination.—Pupils are normal. Slight incoördination in the arms but on account of the spasticity and weakness, it is impossible to test it in the legs. No loss of tactile, pain, or thermic sensation; no loss of joint or vibratory sense in arms but distinct loss in legs. The arm reflexes are brisk; epigastric and abdominal reflexes are absent, knee and ankle jerks are very brisk and there is a double extensor plantar response but no clonus. Unable to stand or walk on account of the extreme spasticity. Blood examination showed 5,700,000 red cells, 80 per cent. hæmoglobin, slight poikilocytosis but no nucleated red cells. Wassermann test on the cerebro-spinal was negative and no increase of globulin or cells. Patient rapidly grew worse and died on December 15th, 1916.

In 1887, Professor Lichtheim described three cases which presented the usual clinical symptoms of pernicious anæmia but in addition all of them had also signs pointing to an affection of the spinal cord. In the first case the signs were rigidity, weakness and ataxia in the legs, with paræsthesia; the knee jerks were present but diminished and the pupils were normal. The second patient had similar symptoms, but in the third the symptoms were clinically a case of commencing tabes dorsalis. In this last case there was no autopsy, but the other two showed distinct changes in the spinal cord. There was almost complete degeneration of the columns of Goll with similar but slighter affection of the pyramidal tracts and small foci of degeneration in other parts of lateral and anterior columns. Lichtheim, thus early, regarded the changes as resulting from a toxic blood condition.

In 1889, with his pupil Minnich, Lichtheim described the conditions found in the spinal cords of patients who had died from pernicious anæmia but in whom no symptoms of spinal disease were present during life. In none of these cases examined was the cord absolutely normal. In one half of the cases there were small sclerotic foci, which on microscopical examination were found to be the result of hæmorrhages. In the other half of the cases there was distinct degeneration in the posterior columns, differing in intensity in the different cords. The degeneration was not restricted to the posterior columns but was most evident in them. In all of them Clarke's columns, Lissauer's tract and the posterior roots were absolutely normal. The view was again expressed that the condition was the result of a toxic blood state and the changes resulting in the central nervous system from another blood state, diabetes, was referred to as analogous. In 1894 the analogy was further strengthened by the researches of Williamson, who found degeneration in the posterior columns of the cord in three cases of diabetes mellitus.

After Lichtheim's communication many excellent reports on the disease by the following authors appeared, Von Noordon, Eisenlohr, Nonne, Bowman, James Taylor, Burr, McCarthy, Mitchell, Clark and Risien Russell. In 1891, James Putnam, of Boston, described "a group of cases of system sclerosis of the spinal cord, associated with diffuse collateral degeneration occurring in enfeebled persons past middle age, and especially in women," in which he showed that the lesions of the spinal cord were not characteristic of pernicious anæmia but occur in other conditions of ill health with or without anæmia. Since then the literature on combined sclerosis has been voluminous and I have appended to this article a list of references.

In 1913, Déjèrine published an article in which he called attention to a certain type of sensory dissociation observed by him in three cases of postero-lateral sclerosis of the spinal cord, one of them coming to autopsy. The dissociation is shown in the fact that in the early stages deep sensation alone is disturbed, more particularly bone sensation and the sense of muscular position. In other words the degeneration in the posterior columns begins in the more medianly situated fibres or column of Goll and in the parts adjacent to the column of Burdach. As the disease progresses there is degeneration of the other fibres with corresponding loss of tactile sense.

Bramwell in discussing pernicious anæmia and its relation to combined sclerosis of the spinal cord, coincides with the view expressed by Collier, that the anæmia and spinal lesions are due to a common factor—probably one or several toxins—but he seems inclined to disagree with Nonne who suggests that the cord lesions are due to vascular changes brought about by the anæmia. Bramwell believes that the anæmia may precede, follow, or be coincidental with the symptoms of the spinal cord lesions, showing that these latter are in no way dependent upon the severity of the anæmia. This fact is well shown in my series of cases; the worst case, No. 4, showed no blood changes, while other cases showed only slight changes. As a rule, however, even though there are no marked blood changes in the early stages, there is usually a grave anæmia of the pernicious type before the death of the patient.

The pathological changes found in the spinal cord are for the most part confined to the white matter, and in the early stages to definite regions of the white matter. The degeneration affects primarily the posterior and lateral tracts; it commences as small areas, which eventually coalesce, forming an extensive sclerosis. It is not a system degeneration, as small areas may be found without any definite connexion with each other. Eventually there is secondary degeneration involving the ascending and descending tracts of the cord. As Déjèrine has pointed out, the medianly situated fibres of Goll's tract seem to be the first affected. In the later stages the anterior horn cells may show signs of degeneration.

The disease has been described under various names, the more common being ataxic paraplegia, spastic tabes dorsalis, ataxo-spastic tabes, subacute ataxic paralysis, combined cord degeneration, and diffuse spinal cord degeneration.

The symptoms are sensory and motor. The sensory symptoms are due to degeneration of the posterior tracts; they are paræsthesia, loss of joint sense, loss of vibratory sense, ataxia and in the late stages loss of tactile and painful sensations. The motor symptoms, consisting of weakness and spasticity in the early stages are due to pyramidal tract degeneration, which is followed in the terminal stages by flaccid paralysis owing to supervening anterior horn envolvement. Batten and Collier have divided the course of the disease into three stages: (1) Ataxia with slight spasticity; (2) Increased spasticity; (3) Flaccidity and complete paraplegia; but in the majority of cases there is no very clear demarcation between the different periods of the disease. The earliest symptoms are usually subjective, such as tingling or numbness or prickling sensation in the legs, but in other cases a tired feeling or tightness and stiffness about the legs may be the initial symptoms. In general terms the motor power is, at first, but slightly affected, perhaps nothing more has been noted than a tendency to fatigue after slight exertion and this has been regarded as an expression of neurasthenia and treated as such. The pupils and cranial nerves are not affected. Mentally the patient may, in the late stages, have periods of delirium and confusion. The sphincters are generally involved in the final stages, either retention or incontinence of urine or fæces. In my series of cases constipation was a prominent and early complaint. Headache does not seem to be a very constant feature of the disease. A brownish pigmentation of the skin of a mottled character may be an early sign and was present in two of my cases. The reflexes may be active, increased, diminished or absent. In the early stages the knee and ankle jerks are usually increased with an extensor plantar response but often this disease has been mistaken for tabes dorsalis on account of the absent knee jerks and Rombergism. In the late stages the knee and ankle jerks are usually absent with extensor plantar response.

Treatment of the disease has not been very successful as the cause of the toxic state of the blood, which causes the spinal cord lesions and the anæmia, has not as yet been discovered. Drugs to improve the anæmia with massage and exercises for the ataxia, are employed. In one of my cases salvarsan was given, but with no beneficial results. All patients should be examined carefully for any source of infection, as pyorrhœa, pelvic inflammation, sinus infection, etc., and appropriate treatment instituted.

Subacute combined sclerosis must not be confounded with multiple sclerosis which is an entirely different form of a disease with a different history of development, clinical findings, and pathology. One is a disease found in persons over forty years of age and the other in those under forty years. One is principally a spinal cord disease while the other involves the whole cerebro-spinal system.

To sum up: Any person over forty years of age, complaining of subjective sensory symptoms, classed under the head of paræsthesias, and weakness or difficulty in walking, should be suspected of having postero-lateral involvement of the spinal cord, even though the blood examination shows no anæmia.

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Mr. F. J. Winlow, of Guelph, Ontario, has been appointed assistant director of the Military Hospitals Commission.

In recognition of his services as Assistant Commissioner of the Canadian Red Cross in France, Major Henry Woodburn Blaylock has been created by the French War Office a Chevalier of the Legion of Honour. Major Blaylock was born at Paspebiac, in the province of Quebec, in 1878. He graduated in Arts from Bishop's College, Lennoxville, in 1900, and in Law from McGill University in 1903. He has resided in England for the past few years.

DUODENAL ULCERS IN INFANCY

By Alan Brown, M.D.

Attending Physician, Infants' Department, Hospital for Sick Children, and the Infants' Ward, Toronto General Hospital; Director, Department of Child Hygiene, City of Toronto

IT is only within the past few years that duodenal ulcers have been recognized in infancy. The first case was published in 1908 and since then groups of cases have been recorded by several writers. The greatest number have been reported only during the past three years probably indicating that the condition is not a very uncommon one and that in all likelihood it has been overlooked as in other obscure affections in infancy.

Up to 1914 there have been ninety-five cases reported for study. Holt in a recent article states that in 1,800 autopsies ulcers were recorded in only four instances, and three of these cases were observed within a period of three months. Entz recorded ten instances of duodenal ulcer in 364 autopsies, and Schmidt observed twenty cases in 1,104 autopsies. A recent report by Helmholtz shows that in sixteen autopsies, duodenal ulcers were present in eight. He calls special attention to certain superficial ulcers which may easily be missed even when autopsies are made with considerable care, since they cause no symptoms during life, and neither hæmorrhage nor perforation is found at autopsy. Half of his cases belong to this group.

Granting that there is a considerable number of such ulcers which may be detected at autopsy only with some difficulty, even then we cannot assume that duodenal ulcers in infancy are at all common. However, as compared with round peptic ulcers of the stomach they are certainly much more often seen.

The average age of infants suffering with duodenal ulcers is between six weeks and five months, the greatest frequency being between the sixth and tenth week; only an occasional one has been described over five months.

Occasionally ulcers are seen in patients of any age and in those who are well nourished, but by far the greater number are of the marasmic or atrophic type. Whether there is a more definite

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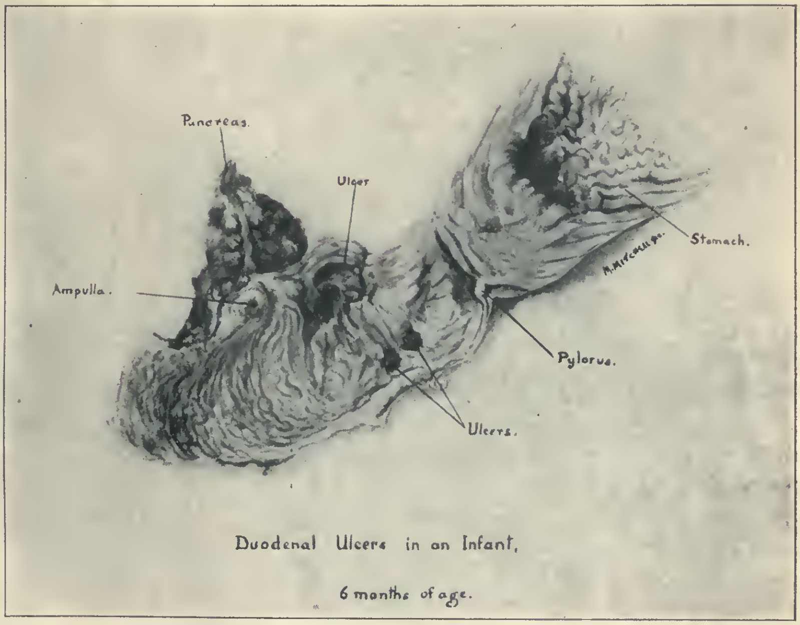

Duodenal Ulcers in an Infant,

6 months of age.

association than simply a lowered vitality, of the mucous membrane of this part of the intestines, it is impossible to say.

Two predisposing factors seem to be of some importance; a lowered general vitality of the patient, as in infants suffering from marasmus, and previous digestive disturbance, a history of which is present in a very large proportion of the cases.

The usual situation of the ulcer is in the posterior wall of the duodenum. Practically all of them are above the papilla and when but a single ulcer is present the usual seat is just below the pyloric ring. The ulcers usually occur singly although as many as two or three in one patient are not unusual.

The average size is from 1·5 cm. to 3 mm. They are invariably circular in shape, have shelving, sharp edges, frequently being described as "punched out" and often show at the base open blood vessels of considerable size. They may involve only the mucous membrane or they may go to the muscular or peritoneal coat and occasionally perforate.

The most generally accepted idea as to pathogenesis is that they are due to thrombosis followed by self-digestion of the mucous membrane over a circumscribed area. The situation of the ulcers, above the papilla, indicates that the lesion is due to the action of the gastric juice. Below the papilla the presence of the alkaline pancreatic and hepatic secretions seems to exert a protective influence on the mucous membrane of the intestine. That it is the direct action on the intestine of the gastric juice not yet neutralized is indicated by an observation of Freunde on an infant two months old, who was operated on by gastro-enterostomy for pyloric stenosis. For a time progress was favourable, then bloody stools were followed by death, the autopsy showing ulceration of the jejunum below the opening which communicates with the stomach.

Symptoms. In fully one third of the cases no symptoms are present during life, the condition being found at autopsy.

In another group of cases death occurs suddenly in collapse sometimes preceded by ordinary gastro-intestinal symptoms and sometimes not. In a few patients with such a history the autopsy discloses a concealed hæmorrhage, the duodenum, and in some cases the intestine lower down, containing large clots though no bloody discharges were present during life. In other cases there was found an acute perforating ulcer and commencing peritonitis.

The only symptom pointing to duodenal ulcer is hæmorrhage. This may appear as blood vomited or as blood in the intestinal discharges. The blood vomited may be bright clear blood, or coffee-ground material. It is not usually in large amounts. Blood from the bowel may be in such small amounts as merely to show a trace in the stool, or large clots may be passed or even fluid blood in considerable quantity. It is then the appearance of blood in the stools, usually in considerable amounts, which first suggests duodenal ulcer, and in patients of the marasmus class or in young infants from one to five months old this cause of hæmorrhage should always be borne in mind.

Diagnosis. The gastro-intestinal symptoms preceding duodenal hæmorrhage are usually of a mild type and subacute, so that entercolitis with its frequent bloody and mucous stools is not likely to be confounded with ulcer. There is lacking also the persistent vomiting, the pain, the tenesmus with the passage of blood and mucous from the bowels, but no fæcal matter, all of which are characteristic of intussusception; although the age of the patients, the suddenness of the invasion and the acute prostration somewhat suggest it. With blood appearing both in the vomitus and in the stool one might be in doubt as to whether the lesion was gastric or duodenal. The far greater frequency of duodenal ulcers of course makes this lesion much the more probable one.

In the case of symptoms pointing to acute perforative peritonitis in an infant duodenal ulcer should be remembered as one of the possible causes and next to appendicitis probably the most frequent one.

From what has been said it will be evident that the diagnosis always has been and still is a matter of much difficulty, and it is not surprising that the disease has been recognized only at autopsy in the great majority of cases reported.

There is one method of diagnosis which I believe is likely to assist materially in these very obscure cases—the passage of the duodenal catheter. To date I have employed this method in two instances, in one case already recorded and in the instance cited below.

Prognosis. Two recoveries have taken place, in one case reported by Schmidt and another by Helmholtz, in each instance the child dying from another condition and at autopsy the duodenal scar was present. The probabilities are that such an outcome is a very infrequent one. The fatal outcome is due quite as much to the condition of the patients in which most of the ulcers are seen, as to the ulcer itself.

Treatment. Medical treatment is symptomatic only and surgical treatment has not been recorded. The case for discussion is the only instance of an attempt at treatment, namely transfusion. I think surgical intervention following transfusion should be the logical procedure.

Case 1. Was admitted to the hospital on three successive occasions with a diagnosis of marasmus or atrophy, and on the final admission duodenal ulcer. His age on the first admission was three months and just previous to death five months. During the previous three months he had not thrived, and suffered alternately from constipation and diarrhœa, the latter being in the form of a milk carbohydrate upset. The infant during this period fluctuated between eight and nine pounds. Physical examination revealed an emaciated male infant, skin hanging in loose non-elastic folds, liver just palpable, organs otherwise negative.

From May 6th to May 12th, which was the date of the last admission, his weight remained stationary and the stools gradually reverted from the loose green type to those of a soapy character. On May 10th it was remarked that the infant looked pale and the following day the child passed four dark-coloured, almost black, stools of a tarry consistency. The test for occult blood was strongly positive. It was further observed that he was considerably weaker and more pale, he was listless, more dehydrated with respirations of 76 and pulse 104—a provisional diagnosis of duodenal ulcer with hæmorrhage was made at this juncture. Almost immediately the duodenal catheter was passed and about 5 c.c. of a bright yellow bile, filled with many brown flecks and numerous bright red flakes and streaks was obtained. This material showed a positive guaiac and microscopic test. A blood examination at this period revealed a severe degree of secondary anæmia, the red cells being but 2,900,000 and the Hb. 38 per cent. From a rough estimation we judged the infant must have lost from two and a half to three ounces of blood.

A blood transfusion was immediately performed and 150 c.c. of the father's blood introduced. Following transfusion the infant passed two fairly large currant jelly stools and died from the effects of the hæmorrhage eight hours later. Post-mortem examination showed the organs to be normal with the exception of the stomach and duodenum, the former contained a coffee-ground material while the latter was filled with one and a half ounces of blood clot of a currant-jelly consistency due to the admixture of mucous.

Situated 1½ cm. from the pylorus was a fairly large "punched out" ulcer with a shelving base. Traversing the ulcer was a moderate sized vessel attached to which was a small clot the size of a split pea. The ulcer measured 1 x 1 cm. Directly opposite this larger one were two smaller ones apparently in the process of healing as the margins were much more indurated and presented no bleeding points. Both of these measured approximately 4 mm. each.

Editorial

ON OLEOMARGARINE

POWERFUL dairying interests have had sufficient influence with their Governments to prevent the manufacture and use of oleomargarine, not only in this Dominion but in many of the States of the Union. And as long as good butter could be supplied to the public at a moderate price within the reach of all, no emphatic demand was made for any cheaper substitute. At the present time, however, with the greatly increased prices asked for all kinds of food material, and with the urgent necessity imposed by the war for economy in every household, the question is asked by many: Why should not use be made of oleomargarine, which is cheap and wholesome and has a high food value?

It is a question in which physicians are much interested and they should be acquainted with the more important facts concerning its proper manufacture and composition.

Oleomargarine had its origin in response to a desire on the part of the late Emperor Napoleon III to furnish the working classes with a substitute for butter, which would be cheaper and more stable. The prize which he offered for the discovery of such a substance was obtained by a chemist working on the Imperial Farm at Vincennes, who endeavoured by chemical and mechanical means to imitate the physiological process which he supposed to take place when underfed cows supply cream of which the fat is derived in great part from the stores in their own body. By treating beef fat first by comminution and pressure and then by the application of heat of a low temperature, and finally by the separation of the stearin and palmatin from the olein by crystallization, he obtained a fat which was free from taste and odour and melted readily in the mouth. It was found to be equally nutritious as butter and had the advantage of having much less tendency to become rancid by keeping.

Large quantities of this new article of food were used in Paris during the siege of 1870 to 1871, and it then gained such a strong hold on the public as an article of food that Paris now consumes it in very large quantities. It is manufactured from many forms of animal fat, and from several vegetable oils, of which the most important are the cotton seed, sesame and soya bean oils. After its preparation it is washed with milk to give it the flavour of butter; in some grades of it a small percentage of butter is added.

Much has been said by those opposing its introduction regarding the poor grade of fats from which it is stated that this oleomargarine may be made. Such assertions are quite erroneous. When a fat becomes in any degree tainted it is almost impossible to remove the odour of the taint and it can no longer be used without greatly impairing the quality of the resulting oleomargarine. Oleomargarine is now regarded by all physiologists and chemists as a wholesome article of food. France, Great Britain, Germany, Austro-Hungary, Belgium, Sweden, Denmark and Italy authorize its manufacture and sale under Government inspection and control. It is especially a food product which commends itself to those who are under the necessity of practising strict economy in their family expenditure. The principal, and in fact the only objection to its use, is the possibility of fraud by the substitution of it for true butter. Legislation to provide for the official supervision of all oleomargarine made, and to ensure that it shall be sold for what it is and not for what it is not, is therefore very necessary.

FLAVINE AND BRILLIANT GREEN

THE January 20th number of the *British Medical Journal* contains a most interesting article* concerning recent experiments on the antiseptic value of certain colouring matters. It has been known for some time that certain of our laboratory stains had antiseptic value. For instance, Churchman, of Yale, some three years ago published results of experiments with gentian violet which were quite encouraging. It has, however, remained for the co-workers who have taken part in the work of which this article is the outcome, to demonstrate the extraordinary efficiency of the colouring agents which go under the names of Flavine and Brilliant Green. The trouble in the past with our standard antiseptics, as these authors point out, has been that they possess also other properties which militate against efficient action in the living body, chiefly that they act as general protoplasmic poisons. As put in Cushny's words, "the ordinary antiseptics do not act more strongly on microbes than on the tissues in which they are embedded." Antiseptics are fixed by protein material in general, and hence show a much reduced potency in the presence of the serum of wounds. They also inhibit phagocytosis; by producing layers of dead tissue they supply a nidus for the proliferation of organisms.

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*Flavine and Brilliant Green, Powerful Antiseptics with low Toxicity to the Tissues: Their Use in the Treatment of Infected Wounds.

The authors then go on to postulate the properties of an ideal antiseptic:

"1. Great potency against all microörganisms in the presence of protein material—for example, serum.

"2. No deleterious effect on phagocytosis.

"3. Absence of irritant action on living tissues in general, so that it may be applied to delicate surfaces such as mucous membranes.

"4. A suitable stimulating effect on connective tissue cells, so as to promote growth of healthy granulation tissue.

"5. The compound, when absorbed, must not be highly toxic for any specialized tissue; thus, even if strychnine were the most potent antiseptic known, its effect on the central nervous system would probably entirely preclude its therapeutic use."

As the result of their experiments which have had a very wide range, Browning and his collaborators are able to state that they have found a compound, "flavine, which is distinctly increased in its effectiveness as an antiseptic by the presence of serum, and further, this among the substances tested is the only one of *high* antiseptic potency which more than maintains its efficiency in serum. Under these conditions, when tested on staphylococci, flavine is about twenty times more powerful than mercury perchloride, and eight hundred times more powerful than carbolic acid or chloramine-T as a bactericide."

More than this, and possibly quite as important, they have found that these two substances are strongly bactericidal in dilutions which have no inhibiting effect on phagocytosis.

A further important point concerns the effect of the antiseptic on tissues. It was found that flavine and brilliant green possessed no irritating effect on such a delicate membrane as the conjunctiva until a very high strength of the solution was reached. Flavine in particular caused no irritation above a strength of 1 in 100, whereas its bactericidal effect is seen in the fact that it kills both cocci and *B. coli* in dilutions of 1 in 100,000. Of the two, flavine and brilliant green, flavine is decidedly the better, as possessing the strongest antiseptic properties, in combination with the least effect on the tissues and on phagocytosis.

Chemically "flavine is diamino-methyl-acridinum chloride which was originally prepared by Benda at the desire of Ehrlich, and was found to have a very marked therapeutic effect in trypanosome infections. It is a fairly stable substance, and solutions may be boiled or heated up to 120° C in the autoclave."

An interesting point concerns the comparison of these new antiseptics with eusol and Dakin's solution. The authors in this connexion have the following to say: "The great value of the *chloramine* and *hypochlorite* group of antiseptics in the case of wounds appears to rest to a considerable extent on their action as solvents of necrotic tissue (Dakin, Cohen, Daufresne, and Kenyon), and on their property of destroying toxic substances, as emphasized by Lumière, rather than on their high bactericidal potency, since, as Dakin has also shown, their bactericidal action in the presence of serum is comparatively weak (for example, chloramine-T is eight hundred times weaker than flavine for staphylococci and four hundred times weaker for *B. coli*); at the same time they interfere seriously with phagocytosis."

The article is chiefly an experimental one, but there is an appendix on clinical observations. During the preceding fourteen months, brilliant green and flavine were largely used in the Casualty Department of the Middlesex Hospital, and also in the wards; between two and three thousand patients were treated. These included about three hundred cases of septic nature and finger infections; also, large superficial infected wounds, infected amputation stumps; and on the other hand, a large number of cases almost certainly infected but treated before suppuration had occurred. A citation of details would occupy too much space. Suffice it to say that the authors come to the definite opinion that, "the results of treatment of septic conditions with flavine and brilliant green show a marked superiority over those obtained by other methods in common use. We consider that the duration of such infections is in general reduced to at least a half, that the stimulus to connective tissue to form granulations is a very outstanding feature, and that these antiseptics can be applied in considerable amounts with the minimum of interference with the normal tissue functions."

The same number of the *British Medical Journal* contains a second shorter article which reports purely clinical results*. This does little more than confirm from the clinical side the claims of Browning and his associates.

It is now generally agreed that the hypochlorite solutions of Lorraine Smith (eusol) and of Dakin represent one of the noteworthy advances in the domain of antiseptics, and one which has already saved a great many lives in the War. It would now seem as if a further quite appreciable advance had been made. The questions which still remain unanswered in these articles concern the question of cost and of marketing of flavine. It does not yet appear whether we can in Canada procure the stains, or whether their expense is going to be a disadvantage as compared with hypochlorite solutions. A footnote, however, gives us the following information: "The preparation of flavine has been worked out by Drs. Barger and Ewins in the chemical laboratory of the Department of Biochemistry and Pharmacology of the Medical Research Committee, to whom we are indebted for the products. Arrangements have been made for the commercial production of the substance on a larger scale. The products will be tested biologically at the Bland-Sutton Institute of the Middlesex Hospital, and will be available for trial on application to Dr. Browning on behalf of the Medical Research Committee."

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*Flavine and Brilliant Green in the Treatment of Infected Wounds, by D. Ligat, F.R.C.S., Acting Asst. Surgeon, Middlesex Hospital.

It appears likely that the trying out of these products in Canada would, for the present at least, be confined to the larger hospitals.

THE "AMERICAN REVIEW OF TUBERCULOSIS"

THE progress made during the past ten years in the study of tuberculosis has led the National Association for the Study and Prevention of Tuberculosis to the conclusion that the time has now come when the results of research and experience should be gathered together in a technical journal devoted exclusively to tuberculosis. No journal of this kind has yet been published in the English language, and for this reason the appearance of the *American Review of Tuberculosis* will be awaited with all the more interest. The name of the Editor-in-Chief, Dr. Edward R. Baldwin, of Saranac Lake, carries the conviction that the new journal will attain a high standard of merit and will meet all requirements. With Dr.

Baldwin will be associated as members of an Editorial Board such well-known authorities as Dr. Lawrason Brown of Saranac Lake, Dr. H. R. M. Landis of Philadelphia, Dr. Paul Lewis of Philadelphia, Dr. M. J. Rosenau of Boston, Dr. Henry Sewall of Denver, and Dr. B. S. Veeder of St. Louis. Dr. Allen K. Krause, Chief of the Division of Tuberculosis in Johns Hopkins Hospital, will be the managing editor.

THE ANNUAL MEETING

WE would call the attention of our readers to the preliminary programme of the June meeting which will be found on another page of this issue. In addition to the addresses in medicine and surgery there will be one in public health and preventive medicine, and we are glad to be able to announce that Dr. Charles J. Hastings, Medical Officer of Health, of Toronto, has consented to give it, having chosen for his subject " The National Importance of Public Health". Dr. Hastings occupies a prominent position in his chosen field of work, and we feel sure his address will be greatly enjoyed.

The President's address will be delivered at the annual dinner which will take place on the evening of the second day.

The combined sections of Medicine and Surgery will devote one session to a symposium on the subject of abscess in the respiratory tract. This is a subject of great interest to the practising physician, as well as to the surgeon, and should provoke an interesting discussion.

We would call the attention of our readers to the fact that in some of the sections particularly there is room for more papers, and would point out that it will be impossible to arrange the programme properly unless all titles of papers reach us at an early date.

Attention is also called to the instructions on the question of railway rates, which will be found in another part of this issue. We would emphasize the fact that if a large number

(300 or over) attend the meeting, our members will be returned to their homes by the transportation companies, free of charge. We would therefore urge all members whose single fare to Montreal costs more than fifty cents to secure the standard certificate from his ticket agent and turn it in at the registration bureau of the Association on arrival in Montreal.

It is proposed to erect in Ottawa a monument to Edith Cavell, and it was decided at a meeting held on January 16th to open a campaign in each of the provinces with the object of collecting the sum of twenty thousand dollars to be expended in the establishment of a fitting memorial.

A deputation from the hospitals of the province of Ontario waited upon the provincial government on March 9th, with a request that the government grant to hospitals might be increased from twenty to forty cents a day for each patient to whom free treatment is given, and that the hospitals should be empowered to collect from the municipalities the sum of $1.50 a day instead of $1.00, the amount now paid for each indigent patient. Mr. W. E. Rundle, chairman of the Finance Committee of the Toronto General Hospital, quoted statistics to show that the government grants had not increased in the last twenty-one years, although the cost of maintaining patients had risen from seventy-two cents to between $1.70 and $1.80 a day.

The following statement recently made by the Department of Militia and Defence will be of interest to readers of the Journal.

It is announced that during the twelve months ending December 31st, 1916, 167 cases only of typhoid fever were reported amongst the many thousands of men of the Canadian

Expeditionary Force in Canada, notwithstanding the fact that typhoid fever is a disease which especially affects young adults from seventeen to thirty years of age, and is endemic in all parts of Canada. This comparative freedom on the part of the Canadian Expeditionary Force is all the more striking when it is remembered that, during the Boer War, one man out of every nine in the British Forces in South Africa was invalided through this disease, and that in the Spanish-American War, of 107,000 men in the camps at Tampa, Florida, and elsewhere, who had not left the shores of the United States, 20,000 contracted the disease. The remarkable change can only be attributed to the process of inoculation. Up to the present the Provincial Board of Health for Ontario has supplied all the typhoid and paratyphoid vaccine used by the Canadian Expeditionary Force which now consists of about 450,000 men, and, altogether, almost 600,000 doses of the vaccine have been supplied free of cost.

A DEPUTATION from the medical profession of Ontario, the Trades and Labour Council, and the Canadian Manufacturers' Association, waited upon the Attorney General of the Province on January 5th, last, to discuss the promised Amendments to the Workmen's Compensation Act. The profession was represented by Dr. E. E. King, President of the Ontario College of Physicians and Surgeons, Dr. John Ferguson, President of the Academy of Medicine, Dr. Milton Cotton, Chairman of the Special Committee appointed by the Academy of Medicine to consider the provisions of the Act in its bearing upon the medical profession, Dr. Herbert Hamilton, Dr. N. A. Powell, and Dr. Griffin, of Hamilton, and Dr. Kellman, of Niagara Falls. The point of view of the profession was ably presented by Dr. E. E. King, who pointed out that provision for medical and surgical treatment of an injured man had been completely ignored in the Act and that the treatment meted out to the profession had been most unfair. Dr. King stated also that, contrary to the belief of some of the labour representatives, doctors were not paid out of the hospital funds for attendance upon injured men in hospitals. The attention of the Attorney General was directed also to the important fact that, had it not been for the loyal assistance of the profession, it would have been impossible for the Government to enforce the provisions of the Act. The Labour representatives expressed themselves in sympathy with the demands of the profession; the manufacturers, however, appeared unwilling to assume the responsibility for any additional payment in cases of accident.

Last year Dr. Charles McIntire resigned the secretaryship of the American Academy of Medicine after twenty-five years of faithful service. In appreciative commemoration the American Academy of Medicine decided to raise a fund, the income of which should be expended in accordance with Dr. McIntire's suggestions. As a consequence the Academy now announces two prize offers, the prizes to be awarded at the annual meetings for 1918 and 1921 respectively.

The subject for 1918 is, "The Principles Governing the Physician's Compensation in the Various Forms of Social Insurance." The members of the Committee to decide the relative value of the essays are: Dr. John L. Heffron, Dean of the College of Medicine, Syracuse University; Dr. Reuben Peterson, Professor of Obstetrics and Diseases of Women, University of Michigan, and Dr. John Staige Davis, Professor of Pediatrics and Practice of Medicine, University of Virginia.

The subject for 1921 is, "What Effect Has Child Labour on the Growth of the Body?" The members of the Committee to award this prize are: Dr. Thomas S. Arbuthnot, Dean of the Medical School of the University of Pittsburgh; Dr. Winfield Scott Hall, Professor of Physiology, Northwestern University, and Dr. James C. Wilson, Emeritus Professor, Practice of Medicine and of Clinical Medicine, Jefferson Medical College.

The conditions of the contest are:

1. The essays are to be typewritten and in English, and the contests are to be open to everyone.

2. Essays must contain not less than 5,000 or more than 20,000 words, exclusive of tables. They must be original and not have been previously published.

3. Essays must not be signed with the true name of the writer, but are to be identified by a *nom de plume* or distinctive device. All essays are to reach the Secretary of the Academy on or before January 1st of the years for which the prizes are offered and are to be accompanied by a sealed envelope marked on the outside with the fictitious name or device assumed by the writer and containing his true name inside.

4. Each competitor must furnish four copies of his competitive essay.

5. The envelope containing the name of the author of the winning essay will be opened by Dr. McIntire, or in his absence by the presiding officer at the annual meeting and the name of the successful contestant announced by him.

6. The prize in 1918 for the best essay submitted according to these conditions will be $100.00; that of 1921 will be $250.00

7. In case there are several essays of especial merit, after awarding the prize to the best, special mention of the others will be made and both the prize essay and those receiving special mention are to become at once the property of the Academy, probably to be published in the *Journal of Sociologic Medicine.* Essays not receiving a prize or special mention will be returned to the authors on application.

8. The American Academy of Medicine reserves the right to decline to give the prize if none of the essays are of sufficient value.

The present officers of the American Academy of Medicine are: George A. Hare, M.D., Fresno, California, President; J. E. Tuckerman, M.D., Cleveland, Ohio, President-Elect;

Charles McIntire, M.D., Easton, Pennsylvania, Treasurer, and Thomas Wray Grayson, M.D., 1101 Westinghouse Building, Pittsburgh, Pennsylvania, Secretary.

THE work of the British Medical Research Committee was described in an editorial which appeared in the December number of this JOURNAL. Since then the second annual report of the Committee has been published, covering the year ending September 30th, 1916. The work is divided into five departments—bacteriology, biochemistry and pharmacology, applied physiology, statistics, and clinical research.

The bacteriological work has been conducted at a British Base Hospital at Boulogne, and in the Inoculation Department of St. Mary's Hospital, London. Particular attention has been devoted by Sir Almroth Wright, the director of this department, to the study of wound infections and their treatment by salt solutions. Similar studies of the treatment of wounds by the use of hypochlorite solutions, made by Dr. Dakin at Compiègne and by irrigation with eusol prepared by Professors Lorrain Smith and Ritchie at Edinburgh have also been subsidized by the Committee; and, as the report says, surgical testimony is still divided upon the respective value of these methods.

The statistical department has continued its enquiry into the epidemiology of phthisis and the periodicity of measles epidemics, but the greater part of its time and energies has been given to the compilation and analysis of army medical statistics; the Canadian statistics are being compiled by the Canadian Army Medical Corps upon similar lines. The importance of such records cannot be overestimated for, in addition to their immediate and scientific value, they will provide the only means of checking claims for pensions in the future. This department also supplies current information to medical officers as to the later history of a case or group of cases for guidance in future treatment, or as to the immediate past history of a case to guide present action. Moreover, valuable assistance has been rendered in the formation of a national collection of pathological specimens for the Army Medical Department.

The director of the department of biochemistry and pharmacology, Dr. H. H. Dale, has been successful in establishing the great clinical value of the double salt—emetine bismuthous iodide—in the treatment of chronic amœbic dysentery. New knowledge has been gained of the life history of the bilharzia parasite and its mode of transference in its alternate generation to the snail and from the snail to man again. It had been shown by experiments on mice during 1915 that man became infected by the passage of embryos through the skin during bathing or wading in infected water, and investigations were therefore directed to methods by which infected waters might be rendered safe. It has been found that by the addition of acid sodium sulphate, 1 in 1000 parts, drinking water could be made harmless, and that in the case of water for washing purposes the addition of army cresol, 1 in 10,000 parts, is effective, and these methods have been put into routine use in all the camps and outposts in Egypt. It has been found also that two forms of bilharziosis are prevalent in Egypt, and that symptoms of hæmaturia are due to worms spread by three species of the snail, genus *Bulinus*, whereas bilharzia dysentery, on the other hand, is due to worms conveyed through snails of the genus *Planorbis*.

Researches into the cause and prevention of cerebro-spinal fever have been conducted by Lieutenant-Colonel Mervyn Gordon, assisted by Major Hine and Dr. Flack. It has been found that the meningococci in the cerebro-spinal fluid are not strictly uniform and four main types of this organism have been described.

Standardized emulsions of killed typhoid and paratyphoid bacilli, and the corresponding standardized agglutinating serums have been prepared in the Standards Laboratory of the Pathological Department of the University of Oxford and have been issued to the naval and military hospitals, and the preparation of standard cultures of the chief dysentery infections has also been undertaken.

Important results have been obtained from the investigation of the health of munition workers and the study of military neurological cases. Physiological tests have been made of salvarsan and neosalvarsan of French and British origin, and the Committee has been able to give valuable advice to manufacturers of these products, thereby ensuring the supply of preparations, little, if at all, inferior to those formerly obtained from Germany.

A TRIBUTE to the work of the Army Medical Services was paid in the British House of Commons by Mr. Forster, the Financial Secretary for War, in his review of army administration and work during the past twelve months. He spoke with particular satisfaction of the improvement of conditions in Mesopotamia, where the War Office is now directly responsible. In France, Salonica, and Egypt the general condition was satisfactory, although enormous difficulties had been encountered and great strain had been put upon the medical resources. The almost total disappearance of enteric fever during the present war was the more surprising when account was taken of the vast numbers of men employed, their density on the ground, and the conditions of the soil, especially in France. Cases of typhoid fever amongst the British troops had numbered down to November 1st, 1916, 1,684, those of paratyphoid 2,534, and of indefinite cases 353, making a total of 4,571 cases of the typhoid group of diseases. Mr. Forster stated also that the system of utilizing the services of the members of the Voluntary Aid Detachments had been highly successful and that the Voluntary Aid Hospitals had been invaluable in linking up the military medical system with the large number of sympathetic workers amongst the civil population.

Canadian Medical Association

ANNUAL MEETING, MONTREAL, JUNE 13TH TO 15TH

PRELIMINARY PROGRAMME (MARCH, 1917)

ADDRESS in Medicine: Theodore C. Janeway, M.D., Professor of Medicine, Johns Hopkins Hospital, Baltimore.

Address in Surgery: F. J. Shepherd, M.D., LL.D., F.R.C.S., Montreal.

Address in Public Health and Preventive Medicine: Charles J. Hastings, M.D., Medical Officer of Health, Toronto.

SECTION OF MEDICINE

J. S. Wright, Edmonton: "The sociologic and economic aspect of tuberculosis."

Robert C. Paterson, Saranac Lake: "Tuberculin, its nature and action."

J. Roddick Byers, Ste. Agathe des Monts: Vocational training in the treatment of pulmonary tuberculosis.

James Third, Kingston: "Tuberculosis, a national problem."

Hugh M. Kinghorn, Saranac Lake: "Rest and exercise in the treatment of pulmonary tuberculosis."

W. B. Kendall, Gravenhurst: "Clinical report of one hundred cases of artificial pneumothorax."

W. Goldie, Toronto: "Neurasthenia as a symptom complex."

E. H. Mason, Montreal: The value of the atropine test in the diagnosis of typhoid fever."

A. McPhedran, Toronto: (To be announced).

E. Grenier, Montreal: "Artificial pneumothorax in the treatment of pulmonary tuberculosis."

W. G. Hepworth, Steveston, British Columbia: (To be announced).

Maude E. Abbott, Montreal: "On the clinical value of the determination of basal metabolism by indirect calorimetry."

Walter M. Boothby, Rochester, Minn., and Maude E. Abbott, Montreal: "On the basal carrying tension of the blood for carbon dioxide in congenital cardiac lesions."

G. S. Mundie and I. J. Erickson, Montreal: "Cerebro-spinal lues."

I. J. Erickson and E. H. Mason, Montreal: "Orthostatic albuminuria."

W. H. B. Aikins, Toronto: "Radium in the treatment of tuberculosis of the skin."

W. F. Hamilton, Montreal: "Pancreatic cyst, three cases."

H. A. Bray, Ray Brook, New York: "Apical breath-sounds in early tuberculosis."

SECTION OF SURGERY

James McKenty, Winnipeg: "Duodeno-jejunostomy; its indications and technique."

Robert E. McKechnie, Vancouver: "The action of wood alcohol in surgical cases."

W. E. Gallie and E. L. Robertson, Toronto: "The transplantation of bone."

Charles K. P. Henry, Montreal: "The surgical treatment of pernicious anæmia."

W. A. Lincoln, Calgary: "Spontaneous rupture of the renal artery.

A. Primrose, Toronto: (To be announced).

J. E. Lehmann, Winnipeg: (To be announced).

J. L. Chabot, Ottawa: (To be announced).

J. A. Nutter, Montreal: "Asthrodesis of the hip joint and its indications."

Lieutenant-Colonel F. G. Finley, B.E.F.: "Trench nephritis."

John Parry, B.E.F.: "Injuries of peripheral nerves."

Major S. Aylwin Smith, B.E.F.: "Technique of nerve suture."

Major G. Peat, B.E.F.: "The effect of gassing."

Major John Meakins, B.E.F.: (To be announced.)

Major A. W. W. Ellis, B.E.F.: (To be announced.)

X-RAY SECTION

H. H. Cheney, Montreal: "The use of *x*-ray in gastro-intestinal diagnosis."

F. S. Pepperdene, Toronto: "Treatment of diseases with *x*-rays."

Captain J. D. Morgan, C.A.M.C.: "*X*-ray at a base hospital in France."

Captain A. Howard Pirie, C.A.M.C.: "The inefficiency of the modern German shrapnel ball."

W. A. Wilkins, Montreal: "Pulmonary abscess."

H. M. Tovell, Toronto: (To be announced).

G. E. Richards, Toronto: (To be announced).

J. E. Panneton, Montreal: (To be announced).

The work of this section will also include a visit to the *x*-ray departments of the Montreal General and Royal Victoria Hospitals. There will be the usual interesting display of plates.

COMBINED SECTIONS

DISCUSSION ON "SUPPURATIVE CONDITIONS IN THE LOWER RESPIRATORY TRACT."

(Speakers to be announced.)

SECTION OF OBSTETRICS AND GYNÆCOLOGY

Several papers have been promised. Contributors and titles will be announced later.

SECTION OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

D. J. Gibb Wishart, Toronto: "Remarks upon the treatment of ozœna by means of polyvalent vaccines, after Horn."

W. G. Putnam, Yarmouth: (To be announced).

Lieutenant-Colonel S. Hanford McKee, Folkestone: (To be announced).

A. Bramley Moore, Montreal: "Injuries to the eye caused by breaking of eyeglasses."

F. Tooke, Montreal: "Complications of senile cataract extraction."

W. G. M. Byers, Montreal: (To be announced).

H. D. Hamilton, Montreal: (To be announced).

George H. Mathewson, Montreal: (To be announced).

J. E. Hett, Kitchener: "Focal infection of the tonsils."

SECTION OF PUBLIC HEALTH

D. Boucher, D.P.H., M.O.H., Montreal: "Teaching of hygiene; its necessity."

E. Pelletier, Montreal: "How to organize effectively a public health department in rural municipalities."

J. A. Baudouin, D.P.H., M.O.H., Lachine: "Sanitary records of houses as established in Lachine."

M. M. Seymour, Regina: "Hospitals in rural districts."

LABORATORY SECTION

E. H. Mason, Montreal: "On the functional diagnosis of kidney disease."

Louis Gross, Montreal: "Reconstructions of circulation in the kidney and their bearing on the pathology of the organ."

D. D. MacTaggart, Montreal: "Medical jurisprudence in civil law."

Maude E. Abbott, Montreal: "Development of the heart in explanation of certain congenital cardiac defects."

Maude E. Abbott: "The Haldane portable gas analysis apparatus for the estimation of carbon dioxide in the alveolar air in the determination of acidosis."

S. J. S. Peirce, Winnipeg: "Wassermann chart with some notes towards standardization of the Wassermann technique."

C. T. Crowdy, Montreal: "On hypernephromata and renal cancers."

Henry Odland, Montreal: "Trinitrotoluene poisoning."

A. A. Bruère, Montreal: (To be announced).

W. J. Scott, Montreal: (To be announced).

Joseph Kaufmann, Montreal: (To be announced).

Horst Oertel, Montreal: (To be announced).

Exhibition of specimens.

MILITARY SECTION

Several papers have been promised and these will be found for the present under the Surgical Section. The chairman of the Military Section is assured of a sufficient number of papers to make this part of the programme a success from every standpoint.

RAILWAY RATES

The usual reduced rates have been arranged on all the Canadian roads terminating in Montreal. These special rates may be obtained by doctors attending the meeting, and by members of their families accompanying them.

In order to take advantage of these rates it will be necessary for the physician when starting, first, to purchase a single first-class ticket (which must cost not less than 50c.) to place of meeting, and second, to obtain from his ticket agent a standard certificate properly filled in and signed by the latter. This must be presented to the General Secretary of the Association when registering at the meeting. It will be filled in by him and viséd by a special agent of the transportation companies, who will attend for this purpose on the 14th and 15th, and who will collect the sum of 25c. for each certificate examined. The presentation of this form properly filled in and viséd will entitle the holder to a return ticket to his home either free of charge or at two thirds, or one third, the regular first-class fare, depending on the number attending the meeting.

From points east of Fort William, Ontario, tickets must be bought between June 9th and June 15th, inclusive, and the return journey may be made up to and including June 19th, 1917. From points west of Fort William, and Armstrong, Ontario, tickets must be bought between June 8th and 11th, inclusive; from British Columbia between June 6th and 9th, inclusive. Certificates for the return journey to the west will be honoured at Montreal up to and including June 19th, 1917. A thirty-days' extension may be secured by the additional payment of one third the full fare from place of meeting to starting point. Stop-overs will be granted holders of these extended tickets.

It is hoped that our members will note that it is important to fulfil all the conditions mentioned above, and it should be emphasized that the greater the number attending, the less will be the cost of railway transportation. Any member requiring special information with reference to transportation is requested to write to Dr. H. B. Carmichael, Chairman of Transportation Committee, General Offices, Grand Trunk Railways, Montreal.

The War

RETURNED SOLDIERS AND THE MEDICAL PROFESSION

CANADIAN physicians and surgeons come in contact with returning soldiers in many ways. They meet, not only as physicians and patients, but as fellow-soldiers, fellow-citizens, and friends. In Canada, members of our profession have an unusually honoured position and have great influence in the formation and control of public opinion; for that reason, it is very desirable that an exact appreciation of the conditions under which discharged, often disabled, soldiers return to their homes should be general among us.

The war has created in Canada many needs, insufficiently provided for by preëxisting social organization. Public and private energies have produced a number of new bodies designed to meet those needs and, on the whole, the situation has been well met. In providing for the needs created by the return of our soldiers it is vital that the thing best for them and best for Canada be secured; the medical profession can do much towards generalizing a knowledge of what is the best thing that can be done by Canada for her returning soldiers.

The republican ideals of France and Great Britain are, in many ways, similar to those of Canada. The old world has been living for two and a half years in a situation which we are only commencing to feel with clear seriousness and it has adopted measures of astonishing uniformity for coping with that situation. Consequently, it is possible for Canada to gain much advantage by a consideration of measures found desirable and adopted in France and in the Mother Country. Both have introduced legislation coördinating and extending the activities of private, semi-private and public bodies preëxisting or established to care for returning soldiers. Canada has done likewise. In addition to the Canadian Army Medical Corps, which is responsible for the active treatment in the field of invalided soldiers, the Military Hospitals Commission and the Board of Pension Commissioners have been created, by the Dominion Government, to aid in caring for returning, disabled Canadian soldiers and sailors. Their work is supplemented by the Provincial Commissions which, at present, are mainly occupied with providing employment and in otherwise assisting the replacement of returned soldiers in civilian life. The part played by the Red Cross Societies, and by the whole-hearted coöperation and assistance of private persons whose position has enabled them to help, can not be omitted from a recital of the measures by which the well-being of our disabled soldiers and sailors is being secured.

The powers of the Military Hospitals Commission are exceedingly broad. To it have been confided most matters concerning the welfare of disabled and discharged soldiers with the exception of pensions and the provision of employment. That it is realizing its responsibilities actively is apparent to everyone who reads its Bulletins; copies of them may be obtained on application to the Secretary of the Commission in Ottawa.

To the Board of Pension Commissioners for Canada has been confided the responsibility of administering the legislation by which Canada gives to her disabled men pensions of unequalled generosity.

By their personal influence, no less than by their professional services, the medical men of Canada can do much to assist these bodies, and the many semi-official, official and private bodies coöperating with them, in securing adequate provision for returning Canadian soldiers. For the convenience of presentation, the processes by which a wounded, or otherwise disabled soldier or sailor, is cared for and returned to his home may conveniently be described in five divisions: they are—

1. Active medical and surgical treatment.
2. Functional reëducation.
3. The provision of artificial appliances.
4. Vocational reëducation, and
5. Establishment in civilian life.

Although these five divisions are named, they are not, in reality, separate processes; nor can strict lines be drawn between them. All are intimately inter-connected and must often be active coincidentally during the progress of a disabled man from active service to reinstatement in civilian life.

Active medical and surgical treatment is secured to Canadian soldiers requiring it by the Canadian Medical Service. The exigencies of war make it impossible for Canadian soldiers always to be cared for by members of the Canadian Army Medical Corps. Injured soldiers are cared for, first of all, by the Medical Corps unit responsible for the area in which they have received their injuries. So it happens that Canadian soldiers often receive first aid, and are for some time, in units and hospitals, maintained by medical Services other than their own.

It is quite unnecessary to publish anything in the CANADIAN MEDICAL ASSOCIATION JOURNAL concerning the personal equipment, organization, or work of the C.A.M.C.; its readers have been informed constantly of these things month by month since the beginning of the war. The system by which men disabled in France are cared for and brought to England is well-known. Well-known, also, are the hospitals in which disabilities of an ordinary type are cared for. Less well-known are the institutions established for the purpose of dealing with injuries and diseases of an unusual nature. The large numbers for which the Medical Service cares have made necessary the establishment of hospitals to care for men whose affections require special treatment.

Among the most interesting of these special hospitals are the orthopædic centres to which men severely, often permanently, disabled by wounds are sent for final treatment. In them, secondary operations made necessary by adherent scars or nerves, by unsuitable stumps, by persistent infection or similar conditions are performed. To them go, also, men suffering from deformities which operation or continued treatment may remove. Very useful work has been done by the first of the orthopædic centres established by the Canadian Army Medical Corps at Ramsgate.

Functional reëducation is a term under which may be grouped all of the means adopted to secure the persistence of a maximum of normal function to an injured part; in military, as in civilian practice, judicious reëducation is advantageously commenced after an injury so soon as it is possible to do so. Usually, however, it is not until a patient reaches an orthopædic centre that functional reëducation is really commenced. The treatment by which the functional reëducation of each case is accomplished is most carefully selected. The French orthopædic centres are equipped for active and passive mechano-therapy, for treatment by galvanic, static, Faradic, and high tension electric currents, by vibration, by bathing, by blasts of hot air, by baths of many kinds, by coloured lights, and by massage, gymnastics, and exercises of various sorts.

European opinion is almost unanimous in insisting upon the prime value in functional reëducation of active movement, commenced and controlled by the patient. At first, the exercises given are simple ones, such as those used in the reëducation of tabetics; these are also of great benefit to men who are awkward and unaccustomed in their movements after an amputation or long confinement in bed. Gymnastics and more violent exercises follow; they, with the employment of machines worked by the patients themselves have quite superseded the use of passive motions obtained by machines driven by motors.

The curative value of properly-selected and properly-graduated work has been recognized everywhere. Work, when controlled by physicians, has not only a high therapeutic value in accustoming disused and damaged tissues to their function; but it has also a high psychic value. While work reaccustoms muscles to action, it reaccustoms minds to the idea of self-supporting labour. It is for this reason that hospitals,—in all of the great warring nations,—provide facilities for work, often under the auspices of a voluntary society; in this way patients, always under the control of physicians, may engage actively in occupations by which remuneration may be earned. In some of the French hospitals supplies are made for the government by patients who are paid for their work; they make magnesium lights, and do simple machine work such as the stitching of towels or of comfort bags. Not the least of the advantages, offered by a system such as this, is the opportunity which it affords the officials concerned with vocational reëducation to recognize a patient's aptitude; it facilitates the making of a sound and early choice of a new occupation for a disabled man who should not attempt to resume the employment which he followed before he became a soldier.

The provision of artificial legs, arms, and other appliances is an important matter; about 3 per cent. of the Belgian wounded have lost limbs and at the middle of 1916 there were about 50,000 men in France who had suffered amputation. The French estimate that about 1 per cent. of their wounded will require an artificial appliance of some sort.

The obligation of the State to provide appliances for one of its disabled soldiers is but a part of its obligation to use every means for bringing his disability to an irreducible minimum. The State must supply any appliance that may be necessary and should maintain it in repair; the appliance supplied must be of the highest quality and the one most apt to the purpose. Much has been learned concerning artificial appliances since the commencement of the war; not, perhaps, so much in the discovery of new devices as in a wider realization of the fact that the best appliance is the one which is most useful to the man who wears it. The best artificial leg, for example, is by no means necessarily the most expensive one, the best-looking one, or the first choice of the man, inexperienced in such things, who is to wear it.

In order to secure uniformity and high excellence in the artificial appliances supplied to disabled men and kept in repair for them by the Government, France has requisitioned all artificial appliances made by her manufacturers; and the Government has established a series of types of artificial limbs, etc., which alone may be supplied. In this way, while a wide choice is left to orthopædic surgeons in the selection of artificial appliances, all the evils of commercialism have been avoided.

The continental governments supply, broadly-speaking, two main types of artificial limbs to their mutilated soldiers. There is the rough, strong arm or leg for heavy work and the more or less elaborate one for lighter employment; the chief use of the latter type of limb is that it disguises a loss. In limbs which are often supplied, a combination of the two types is effected, so that a man has a useful, strong instrument for work and, by the addition of an appropriate attachment, is able on occasion to dissimulate his loss. The more elaborate mechanical limbs, such as the arms enabling an armless man to strike matches, take off his hat, etc., are, at present, useful especially for those engaged in light employment and for those who have lost both arms.

In Australia, since the dependence of a disabled man upon his artificial appliances is recognized, those who have lost arms or legs are supplied with duplicate limbs so that they will have always one in reserve, ready for use, should the other be broken. The French Government is providing for the repair of the thousands of artificial appliances which its people will wear for half-a-century to come by the establishment of manufacturing orthopædists throughout the country. Men receiving artificial limbs will be given a fraction of the cost of their appliances annually with which to keep them in repair.

In its own workshops, the French Government produces artificial limbs at a cost of less than one-third of the usual retail price. The Canadian Government has also established a plant for the manufacture of artificial limbs in connexion with the large Central Military Hospital for returned soldiers at Toronto. The advantages of having a workshop, in connexion with an institution where there are large numbers of men requiring prosthetic appliances are obvious. Such an arrangement ensures the delivery of properly-fitting appliances to their wearers within a reasonable period and makes it easier for the surgeon to be certain that his directions have been followed by the makers of artificial limbs.

Vocational Training is the term applied to the instruction given to disabled men in order to prepare them for the occupations to which their aptitudes and social circumstances make them most suited. In France, it has been estimated that about four-tenths of one per cent. of the wounded will require vocational re-ëducation; since it will be inadvisable for them to follow their former employments.

It is extremely important, from every point of view, to ensure an opportunity to be self-supporting to every disabled man. The after·history of those who have received monetary compensation, alone, for injuries incurred through industrial accidents shows that the rehabilitation of an injured man connot be secured by the mere payment to him of a sum of money. Disabled men who receive money alone, and are not assured an occupation, almost always deteriorate and lose their social position. For that reason, the rehabilitation of an injured soldier cannot be secured by bringing his disability to an irreducible minimum and by the payment to him of a pension; to discharge its indebtedness to him his country must, in addition, make him employable, by appropriate reëducational training, if military service has deprived him of his occupation, and must help him to find employment.

The selection of an occupation suitable for him is of paramount importance to a disabled man. His choice must not be made lightly. He must be guided and assisted by those expert in the estimation of abilities and in the advising of vocations. The aim must always be to select for a disabled soldier an occupation in which, by superior training and knowledge, he will be able to support himself, in spite of his physical handicap, in competition with sound workmen. It is a difficult thing to do, since a mutilated man can never be the physical equal of one who is sound; for that reason, it is necessary to furnish a disabled man with knowledge sufficient to give him an assured position. Often, it is possible to make a man capable of directing others by giving him further instruction in an occupation already familiar to him; he is then, consequently, placed in a position either to become an overseer or an employer of labour.

It is essential that the occupation of a disabled man should be carefully chosen. Past experience makes it certain that the present spirit of gratitude and sympathy towards disabled soldiers will not always survive. It will diminish, and perhaps disappear, in a few years after the war when the economic struggle once more becomes keen. Competition will be acute, then, and unless a disabled man has chosen his occupation wisely and is master of it his position will be most unfortunate.

It is by no means necessary for all disabled men to receive vocational training; but, when it is necessary, training should commence early so that a habit of idleness may not be formed. There are many whose occupations or social circumstances make it advisable for them to return to their homes and to their normal activities so soon as may be. No disabled man, less fortunately situated, should be permitted to return to his home until he has been placed in a position where he is capable of supporting himself. It must be remembered that only those with expert knowledge can accurately estimate the capacity of a disabled man for a given occupation; consequently, only they can wisely advise a disabled soldier in his choice of an occupation. To do so requires an intimate knowledge of the state and probable trend of the labour market in the locality where the soldier intends to live, of the operations performed in an occupation and both of the way in which a soldier's injuries interfere with the performance of that operation and of means by which that interference can be removed or avoided. Such knowledge is possessed by those constituting the Disabled Soldiers' Training Boards established by the Military Hospitals Commission for the purpose of assisting soldiers in their choice of occupation and for the purpose of directing and controlling the instruction received by disabled soldiers.

Functional reëducation, vocational training and the provision of artificial appliances are complementary processes; consequently it is advantageous that they should be carried on, coincidentally, in a single institution—in a centre of reëducation. The Central Military Hospital at Toronto is an example of such an institution; there are many with similar functions in France. In them French soldiers are measured for and supplied with artificial appliances while they are undergoing functional reëducation and vocational training. In this way, all of the operations connected with the return of a man to civilian life proceed concurrently and uninterruptedly without loss of time until he is ready to return to civilian life.

A certificate of capacity is given to soldiers who have satisfactorily received vocational training. The utmost care is taken in maintaining a high standard of efficiency in those to whom certificates are granted, in order that employers may feel safe in relying upon the competence of those possessing them. In France, every effort is made to enable disabled soldiers to go directly from a centre of reëducation to an employment. It has been found that, if they do not find remunerative occupation so soon as they are ready for it, they are apt to become discouraged and to accept their incapacity as a permanent disability, instead of as a stimulus to unusual effort.

At first, in France, as in England, disabled soldiers were loathe to undertake a course of vocational training which involved a stay of several months in an institution. The advantage gained by the training was soon appreciated, however, and, in France, that disinclination has disappeared. Now, the situation is quite changed and men ask for and insist upon receiving the instruction provided for them. They have come to appreciate everything which secures renewed independence to them. The most successful of the Institutions devoted to vocational training are residential and are strictly regulated; it is found that men, far from resenting discipline, welcome and are anxious to maintain regulations when the advantage of them is understood.

While France commences the vocational training of disabled soldiers in hospitals and has established special "centres of reëducation" for that purpose, full use is made of educational institutions already existing. Unfortunately, the number of disabled men who can be taught in existing technical schools is not very large; if a considerable proportion of those attending these schools are disabled soldiers the ordinary running of the institution is interfered with and made impossible. Arrangements have also been made by which disabled men may obtain instruction through apprenticeship or employment in business houses. In order to stimulate disabled men by example and to prove to them that men disabled like themselves can be successful the teachers instructing disabled soldiers are, as far as possible, themselves chosen from among disabled men.

It is fully realized that one of the most important of the functions of a centre of reëducation is to secure a proper outlook and a spirit of cheerful hope to its inmates. Depressed by suffering and overcome by a knowledge of their incapacity they are often downcast; they are prone to believe that they can never again be self-supporting. Since the importance of a proper mental attitude in wounded soldiers is recognized; every effort is made in the French hospitals—by the counsel of physicians and nurses, by pictures posters and instruction of all sorts—to spread the knowledge that men, though disabled, can by appropriate reëducation become self-supporting. Every means is taken of informing men in hospitals of the measures designed for training them, for—when it is necessary—making them employable, for providing employment for them and for pensioning them in accordance with their incapacities. Very important is it to let it be known that men undergoing vocational reëducation are paid for their work.

"Establishment in civilian life" is the title given to the last of the five divisions under which the processes by which a disabled soldier is cared for and returned to his home are described. Under this heading fall, in addition to pensions and the providing of employment, such matters as the settlement of returned soldiers upon the land, the establishment of means by which returned soldiers requiring capital or credit for the commencement of farming or other activities may obtain it; these things do not exhaust the list of matters to be considered in connexion with the establishment in civilian life of returning soldiers.

At present, it is difficult neither in Canada nor in France for returned soldiers to find employment. There is much more work to be done than there are hands to do it. Both nations have made it easier for returned soldiers to find employment by a decree that Government employment, other things being equal, always shall be given to returned and disabled men or to their dependents. That such a preference should exist is just. Nevertheless, it seems very unadvisable that any machinery, such as a system of employment agencies, established for providing returned soldiers with employment should deal with returned soldiers alone. Whatever machinery is used, should be employed in providing employment for all citizens, whether they are returned soldiers or not. Should it be otherwise, the tendency will inevitably be to consider returned soldiers as a class by themselves. Although such an understanding would have no ill effect at present, it could not fail but be detrimental to returned soldiers in the future; when the war is over they must find employment in competition with men who are whole. If they find employment through machinery other than that used by sound men, the tendency—because of their incapacity and its consequent pension—will be to treat pensioners as an inferior class of labour to be hired at rates less than those earned by ordinary workmen.

The system by which France expects to meet the problem of finding employment for the thousands of men who must be returned to civilian life at the end of the war is very similar in its organization to the system of employment bureaus existing and operating in Great Britain under the Board of Trade. The essential feature of that system is that it possesses branches throughout the country which are closely in touch with one another; these branches advance transportation to men who are travelling towards employment.

Soldiers who are entering upon civilian life will often require assistance in order that they may be established, ready for work, in a workshop or on a farm. The artisan will require tools, material, and money to secure his subsistence until his business is established; similarly, the farmer will need help in purchasing live stock, tools and seed before he can commence to live by his land. The French, with admirable foresight, have made arrangements by which men undergoing reëducation are enabled to earn money so that they may have a small capital when they leave the centres of reëducation. Proposals have also been made to create a special bank for the purpose of providing financial assistance to soldiers who will require it on their re-entrance to civilian life.

France has made arrangements by which the cost of accident and life insurance and of similar services, where price depends upon normal probability, will not be increased to disabled soldiers. It is necessary that some such arrangement should be made, since employers will hesitate to engage partly disabled men who, by reason of their incapacity, are more liable to accident, and for the same reason will suffer more severely from a given injury than would a man who was sound. An excellent illustration is supplied by the case of a man who has lost an eye. A one-eyed man is more exposed to accidents than one who has two eyes, and if a one-eyed man loses the eye remaining to him the accident which deprives him of it leaves him not one-eyed but totally blind.

Pensions, purposely, are mentioned last among the matters discussed under the "Establishment in Civilian Life". They are mentioned last to emphasize the fact that though pensions are often discussed, they are in reality a very small and comparatively unimportant part of the procedure by which a soldier is rehabilitated. From the point of view both of the disabled man and of the State, the importance of his pension is as nothing compared with the importance of securing an ability and an opportunity to be self-supporting to a soldier who has been incapacitated by military service.

The principles governing the granting of a pension are clear. France, a democratic country like our own, has expressed them well. She is fighting a national war in which each of her citizens has equal interest; therefore, all personal detriment resulting from war should be equally distributed among her citizens. Pensions are awardable to disabled men in direct proportion to the extent of the incapacity caused by their service. The amount of the pension received by a man who is totally disabled must be sufficient to support him and his family in decent comfort. The amount of pension awarded to a partly disabled man depends entirely upon the degree of his incapacity; it is in no way influenced by his social position or earning power. A pension is the inalienable right of the individual to whom it is awarded; it can be diminished for no reason other than a lessening of the incapacity in respect of which it is granted. Since pension is awarded to a man because of an incapacity resulting from military service, it is reasonable that pension be refused to a man who has been incapacitated by his own wilful misconduct or viciousness. For the same reason, pension is denied to a man who unreasonably refuses some simple treatment by which his incapacity might be reduced or removed.

In France, as in Canada, the value of the pensions granted is greater than ever before. One of the reasons which has supported the increase in the amount granted to pensioners is the conviction that it is desirable to avoid the construction of homes for old soldiers. It is, of course, inevitable that there will be a small number of discharged soldiers who, although receiving pensions, will be incapable of looking after themselves entirely and can find no place in existing institutions or with friends. Such persons will be those violently insane and those requiring constant attention for other reasons; for them, it may be necessary to establish special institutions. The vast majority of French pensioners would not consent to become inmates of any institution established for them; the soldiers serving in the armies of France are men accustomed to home life; the soldiers for whom past generations established Les Invalides were professional soldiers who had spent most of their lives in barracks, and had never had homes of their own. It is much more in accordance with modern social organization to give disabled soldiers a pension of an amount sufficient to secure them decent comfort in their own homes or as boarders and lodgers in private families.

While it is desirable that private benevolence should have an opportunity of assisting men returned from our armed forces, it is quite certain that the unorganized activity of individuals and of small incoördinated societies inevitably results in unnecessary waste and in useless expenditure of the national resources; consequently, French legislation controls the activities of private societies and individuals. Persons and societies are permitted to accept contributions for purposes connected with the war only when they have received permission to do so from the Government. It is, moreover, probable that a central body will be organized in each Department of France to have the sole control of all activities connected with the care of returning soldiers and with similar matters.

In France, certain individuals, by generous subscriptions and other means, are endeavouring to secure a personal following among the members of returned soldiers' societies in order to further private political ends; but the whole country is so closely bound together in unity of purpose that there seems to be no danger of ex-soldiers uniting in organized societies in order to secure privileged advantage to themselves by political action. None the less, wounded men will be strong in insisting upon their rights. For that reason—in Canada as in France—there should be an accurate appreciation in the national mind of exactly what those rights are.

Conclusion

Canada is fighting a national war; for that reason the detriments incurred by Canadian soldiers should be distributed as equally as possible among all Canadians. Only the rehabilitation of men who have suffered personal detriment by reason of their service is considered here; discussion of the equalization of economic detriment is avoided.

To secure the equitable return to civilian life of men who have been disabled by their service is a work of large dimensions. It can be accomplished best under the control of specialized agencies each closely connected with the field of its responsibilities. Since the rehabilitation of disabled men is a temporary operation, permanent machinery should not be created for effecting it unless a permanent use for that machinery exists; therefore, existing institutions and public services should be employed in caring for disabled men whenever it is possible to do so. While private benevolence may be advantageously employed it should find no essential place in providing the gladly-given advantages which disabled men receive as a right from their fellow-citizens.

All measures adopted for returning disabled men to civilian life should tend to place them, in the best and quickest manner, in an independent position in civilian life; any delay in doing so dependent upon administrative difficulties, is inadmissible. Matters important in the reinstatement of a disabled man in civilian life are, active medical and surgical treatment, functional reëducation, provision of artificial appliances, professional reëducation, provision of pension, assistance to employment, advancement of capital, settlement upon the land, etc. All of these matters have been alluded to in preceding paragraphs.

There remains one matter so far undiscussed: that is the recognition, by soldiers and public alike, of the Military Hospitals Commission, the Provincial Commissions, and the Board of Pension Commissioners, as bodies entrusted with the duty of watching over the interests of discharged soldiers. It is desirable that every Canadian should realize that these bodies are trustees appointed to care for returned men. They serve returned soldiers and sailors. It is their duty and aim to voice the needs and to watch over the interests of returned men with all of the emphasis that their responsibilities enable them to give. The problem of securing the proper return of discharged and disabled men to civilian life will be made less difficult if a knowledge of the duties of these bodies and of the measures by which disabled men are cared for become general. There cannot be a proper frame of mind and a right understanding of their position among returning men unless they and the general public are familiar with the measures by which the personal and social rehabilitation of disabled soldiers is secured; there must be a general appreciation among Canadians, not only of that which Canada owes her disabled soldiers, but of that which a disabled soldier, still a citizen, continues to owe to his country.

In Canada, the medical profession can perform a work of great public value by constantly endeavouring to spread a proper understanding of these matters. Soldiers and civilians alike should realize that it is not only to the advantage of disabled men to accept all that treatment and training can do for them; but that it is their duty to do so. Canada owes them rehabilitation and reinstatement in civilian life; but they, like every Canadian, owe their country a willingness and an endeavour to be self-supporting to the extent of the capacity that remains to them.

Major, C.A.M.C.

Miscellany

Book Reviews

FOCAL INFECTION: THE LANE MEDICAL LECTURES. BY FRANK BILLINGS, Sc.D., M.D. Delivered on September 20, 21, 22, 23, and 24, 1915. Publishers: D. Appleton and Company, New York and London, 1916.

"THE Lane Medical Lectures for 1915" of the Stanford University Medical School in San Francisco, by Dr. Frank Billings, of Chicago, have been issued by Appleton in book form, and constitute a valuable contribution to our knowledge of focal infections. In fact they represent an excellent monograph on focal infection. Dr. Billings is to be congratulated, first of all on his success in developing his scheme of team work among the various departments, clinical and scientific, of the Rush Medical College with the University of Chicago and the Presbyterian Hospital. It is rather a new thing, and rather a fine thing, to have been able to get so many widely separated men, all of them engaged in other work of immediate interest to themselves, to become enthusiastic over, and help in, a a piece of work such as this, which obviously needs the coöperation of widely varying departments. Chicago has set a good example in this respect.

Dr. Billings takes up in these lectures the general consideration of focal infection; then, in particular, the streptococcus pneumococcus group; then the acute and chronic diseases related to, or dependent upon, focal infection, and finally, treatment, ending up with a very good bibliography. The whole constitutes an excellent monograph. The conclusions drawn possibly at times go a little beyond the evidence, or, at least, would appear to do so in the opinion of some; but on the other hand it is certain that in the past we have far too little regarded the influence of hidden local infections in the production of acute and chronic general diseases.

Dr. Billings includes in his list of diseases related to focal infection the following: acute rheumatic fever, rheumatic endocarditis, myocarditis and pericarditis, chorea, acute systemic gonococcus infection, malignant endocarditis, acute nephritis, acute appendicitis, cholecystitis, acute gastric and duodenal ulcer, acute pancreatitis, erythema nodosum, herpes, spinal myelitis, acute osteomyelitis, thyroiditis, iridocyclitis. Under chronic diseases dependent on focal infection he includes, chronic infectious arthritis, chronic infectious nephritis, chronic cholecystitis, chronic peptic ulcer, chronic infectious endocarditis.

A great deal of the argument rests upon the observations of Rosenow, now so well known. Whether time will prove that the mode of infection here described as valid in such things as appendicitis, cholecystitis, gastric and duodenal ulcer, acute pancreatitis, and a number of other diseases, is to be enlarged to cover such a big proportion of these diseases, may perhaps be questioned. It is fairly certain that they depend in many instances upon other modes of infection than hæmatogenous and lymphatic routes here described proceeding from foci of infection in the body. Nevertheless, clinical evidence as gathered in all big hospitals now following the lead of the Chicago men, goes to show the very great value of hunting in all obscure cases for hidden foci of infection. Cure often follows upon such a discovery and the appropriate treatment.

The book is cordially to be recommended, not only to surgeons and internists, but also to the general practitioner.

MEDICAL AND SURGICAL REPORTS OF THE EPISCOPAL HOSPITAL. Edited by ASTLEY P. C. ASHHURST, M.D. Vol. III. Philadelphia:, Press of Wm. J. Dorman, 1915.

THE present volume of "Medical and Surgical Reports from the Episcopal Hospital", of Philadelphia, contains a great deal of interest and of value It would occupy too much space to give a complete list of the articles, but it may be said that they occupy all phases of the activity of a large general hospital, and are written by men who are obviously keenly interested in their hospital work, and are endeavouring to present the results of their experience in such a way as not to allow to go to waste the valuable clinical material of the hospital, and more than that, to do something to advance the science of medicine. The papers, as a whole, are on a high level. They include such subjects as lues, functional kidney tests, blood transfusion, various skin affections, fractures and dislocations in their various aspects, arthroplasty, different eye lesions, gunshot wounds of the chest and of the abdomen, and the Cæsarean operation. A number of excellent skiagrams are included. Here and there one finds quite original work, as for instance, the observations of Moore upon the effect of atropine and of adrenalin on the flow of cerebro-spinal fluid in a case of fracture of the skull, and his conclusions concerning the nature of the cerebro-spinal fluid. Ashhurst has an interesting paper on cinematoplastic amputations according to the method of Vanghetti. There is also an interesting and well-written paper on the history of anæsthesia. Altogether it is a creditable book.

THE AMERICAN YEAR-BOOK ON ANÆSTHESIA ANALGESIA. Editor, F. H. MCMECHAN, M.D., A.M. 420 pages and 250 illustrations. Surgery Publishing Company, 92 William Street, New York, 1916. Price $4.00.

THIS volume, the first of what one may hope will be a long series of such volumes, contains a large number of original articles bearing upon anæsthesia, not alone from the side of the anæsthetist, but also from that of the surgeon. Practically all of the papers, numbering some thirty, are valuable. It is in fact a series of small monographs. It would be quite impossible to give even an abstract of all of the papers, but a partial list of the contents will serve to indicate to those interested the nature and value of the work done. To begin with there is a long article by Lillie, of Worcester, Massachusetts, on the Physico-Chemical Theory of Anæsthesia, which gives a very good review of the various theories concerning the fundamental nature of the anæsthetic effect. Attached is a complete biography numbering one hundred and sixty references. Following this there are excellent articles bearing upon shock. One on the Peripheral Origin of Shock, by Mann, of Rochester, Minnesota (the work being done under Dr. Gatch, of Indianapolis). A second on Circulatory Disturbances due to operation and the Effects of Posture and Depth of Anæsthesia; these by Gatch. A third, on Blood Pressure and Anæsthesia, by McKesson, of Toledo. These papers, particularly those by Gatch, and Mann, bring out a lot of new work and are most valuable. Crile contributes an article on Anæsthesia, Anæmia, and Resuscitation. Yandell Henderson considers respiration in relation to Acapnia and Anæsthesia. Two good papers are given on Chloroform Syncope and Delayed Chloroform Poisoning; one by Levy, of London, the other by Graham, of Mason City, Iowa. Other valuable papers are the following: Alkaloidal Amnesia in Obstetrics, by J. O. Pollack and B. B. Matthews, of Brooklyn. Further Researches in Novocain-Suprarenin Anæsthesia, by R. H. Riethmuller, of Philadelphia; Spinal Anæsthesia in the Cat, by W. T. Porter, of New Haven, Connecticut, and G. G. Smith, of Boston.

There are also half a dozen good practical papers especially applicable to the needs of the dentist; and some three or four papers on local anæsthesia as applied to the surgery of the ano-rectal region, hernia, prostatectomy, and the gasserian ganglion.

It is a book which not only every anæsthetist but every surgeon who is endeavouring to practise his art scientifically should have.

SYPHILIS. By LLOYD THOMPSON, PH.B., M.D., physician to the Syphilis Clinic, Government Free Bath Hospital. 415 pages with 84 illustrations. Publishers: Lea & Febiger, Philadelphia and New York, 1916. Price $4.25 net.

DOCTOR THOMPSON has at the beginning of his book a short history of syphilis with its geographical distribution and prevalence. He then goes on with the different phases of the disease itself. There are separate sections on regional and congenital syphilis. In one volume the author has presented his subject in a practical and very concise manner. The chapters on diagnosis and treatment are especially good.

Laboratory methods of diagnosis are fully described and their value well expressed.

The book is one of the best of its size on syphilis, for medical student and practitioner alike.

Books Received

PUBLIC HEALTH NURSING. By MARY SEWALL GARDNER, R.N., Superintendent of the Providence District Nursing Association. With an introduction by M. ADELAIDE NUTTING, professor of nursing and health, and director of department Teachers' College, Columbia University. Publishers: The Macmillan Company, New York, 1916.

WITH A FIELD AMBULANCE AT YPRES : BEING LETTERS WRITTEN MARCH 7–AUGUST 15, 1915. By WILLIAM BOYD, professor of pathology, University of Manitoba. With illustrations. Publishers: The Musson Book Company, Wilton Avenue, Toronto, 1916. Price, $1.00.

Obituary

SIMON JOHN TUNSTALL, B.A., M.D.

Dr. Simon John Tunstall, who died recently at Vancouver, was born at Ste. Anne de Bellevue, in the province of Quebec, in 1852. He was educated at the old High School in Montreal and entered McGill University as a student in the Faculty of Medicine, graduating with honours as the first of his year in 1875. Dr. Tunstall practised for a short time at Papineauville, Quebec, and then went west to Kamloops, British Columbia, where he was in charge as medical attendant of a large number of men during the construction of the Canadian Pacific Railway. In 1892 he removed to Vancouver, where he continued to practise up to the time of his death. Dr. Tunstall always took a keen interest in professional and public affairs and was popular with confrères and patients alike. He became President of the College of Physicians and Surgeons of British Columbia, and was President of the Canadian Medical Association in 1904 when the annual meeting was held at Vancouver. He was also a director of the Vancouver General Hospital. Dr. Tunstall was a thorough and enthusiastic Scotsman, a descendant of Major Fraser who fought with Wolfe at the siege of Quebec, and deeply interested in all things pertaining to the welfare of the Highlanders and their descendants; he was President of the Caledonian and St. Andrew's Societies. His unbounded enthusiasm, universal cheerfulness and goodness of heart made him lots of friends. He is survived by a widow and five daughters.

FRANCIS J. HOGAN, M.D.

Dr. F. J. Hogan, who died of pneumonia at his residence at St. John, New Brunswick, on March 1st, was highly respected not only in St. John but throughout the Maritime Provinces. Though still a young man, he enjoyed an extensive practice and had won both popularity and an enviable reputation. Of an engaging personality, he made many friends and the news of his untimely death was received with profound regret. The esteem in which he was held by his confrères is evidenced by the fact that he was both president of the St. John Medical Society and Secretary of the New Brunswick Medical Society. After receiving the degree of

B.A. from St. Francis Xavier University, Antigonish, Dr. Hogan entered upon the study of medicine at Harvard, where he graduated in 1908. He then took a post-graduate course in surgery at Cornell University, after which he returned to St. John and commenced to practise. He leaves a widow.

Dr. C. T. Allen, of Dorchester, New Brunswick, died suddenly on February 19th, at the early age of thirty-four years. Dr. Allen had been practising at Dorchester for about a year and was most popular and highly esteemed. He leaves a widow and three children.

Dr. Joseph Andrews died at St. John, New Brunswick, on February 21st, in the seventy-fourth year of his age. He was a graduate of Harvard Medical College and practised for a time at South Boston. Later on, however, he returned to St. John, his native city, where he built up a large practice.

Dr. Edgar D. Harrison died at Madoc, Ontario, on March 4th. Born near Glenora, Ontario, in 1866, he graduated as a teacher from the Ottawa Normal School and became principal of the public school at Moira. Three years later he entered Queen's University as a student of medicine and graduated in 1891. He at once went into practice at Madoc, where he built up a large connexion, particularly among the people of the neighbouring country districts.

Dr. John Nixon Thompson, of Omemee, Ontario, died January 22nd, in the seventy-first year of his age. Dr. Thompson graduated from Trinity Medical College, Toronto, in 1874 and had been in practice at Omemee for about thirty years. He is survived by a widow and seven children.

Dr. A. D. McCrimmon died at Ripley, Ontario, on March 9th, in the eighty-second year of his age. He was born in Glengarry County in the province of Ontario of Scotch parentage in 1836 and graduated from McGill in 1869, taking the medal in biology. He immediately went into practice at Lucknow and was wonderfully successful in his treatment of cases of meningitis during the epidemic which occurred in Huron County. After practising for some years, Dr. McCrimmon went to Edinburgh where he obtained the degrees of M.R.C.S. and L.R.C.P. A serious illness, however, obliged him to give up work for a time and upon his recovery in 1895 he went into practice at Ripley. He is survived by his widow and seven children.

Dr. Charles Ault died at Montreal on March 4th. He was born at Aultsville, Ontario, on July 15th, 1833, and graduated from McGill University in 1855. After practising for a time at Richmond, Quebec, Dr. Ault gave up the practice of medicine and went into business in Montreal.

News

MARITIME PROVINCES

Dr. Thomas Jean Bourque, of Richibucto, New Brunswick, has been appointed a member of the Senate. Dr. Bourque has been in practice at Richibucto since 1889. He was elected to the House of Assembly in 1908 as member for Kent County and was reëlected in 1912.

ONTARIO

The following cases of contagious and infectious disease were reported in the province during the past year: smallpox, 174 cases, 3 deaths; scarlet fever, 1,449 cases, 39 deaths; diphtheria, 3,212 cases, 284 deaths; measles, 21,977 cases, 227 deaths; whooping cough, 2,205 cases, 97 deaths; typhoid fever, 1,225 cases, 158 deaths; tuberculosis, 1,813 cases, 984 deaths; infantile paralysis, 190 cases, 27 deaths; cerebrospinal meningitis, 195 cases, 129 deaths.

The transfer of the medical inspection of schools in Toronto from the Board of Education to the Board of Health was approved by the Municipal Committee of the Ontario Legislature on March 16th.

The fourth annual report of the Institute of Public Health, London, which covers the twelve months ending June 30th, 1916, is the first report of the Institute to be printed, although typewritten copies for the three preceding years have been filed. These reports show continuous growth in every branch of the work of the Institute; the staff has been increased from five to thirteen members and whereas in 1912-13 about 400 specimens were examined, in 1915-16 no less than 5,400 examinations of specimens were made. One of the principal objects for which the Institute was established was the education of the general public in matters pertaining to public health, and, with this in view, efforts have been made to reach all classes—members of the profession, medical students, nurses, teachers, clergy, and the public generally—by means of articles published in medical journals, addresses, lectures, circulars, and so on. More than one hundred and fifty lectures have been delivered before clubs, Y.M.C.A. meetings, farmers' institutes and other gatherings, and hundreds of newspaper articles have been published. In the laboratories of the Institute examination is made gratuitously of sputum, diphtheria cultures, water, milk, sewage, etc., submitted by medical officers of health, municipalities, or the military authorities of the district. Commercial analyses or clinical laboratory examinations of all kinds are done for individual persons upon payment of a small fee, or, in necessitous cases, without charge.

The work of the Institute is divided into a Division of Epidemiology, with a subdivision of Vital Statistics; a Division of Chemistry with Public Health Bacteriology and Sanitary Engineering as subdivisions; and a Division of Pathology. It is pointed out that the pathological division is a substitute for a future division of public health physiology, which will only become possible of attainment "when public health has emerged from the struggle with disease into the greater field of developing health". The subdivision of Vital Statistics naturally has been occupied during its first year largely with questions of organization. The purpose of this department is twofold: to conduct statistical investigations of public health questions, and to offer instruction in vital statistics and allied subjects. An investigation of the infectious diseases of the school children in London has been completed.

A course for the degree of D.P.H. has been organized by the Institute and was advertised in 1915. Of numerous applicants none were in a position to fulfil the complete requirements of the course exactly as laid down. Three candidates, however, were permitted to register for partial courses, to complete training in those subjects in which they were deficient, but for these the time requirements were doubled.

QUEBEC

The ninety-fifth annual meeting of the Board of Governors of the Montreal General Hospital took place on Tuesday, February

20th. During the past year two members of the medical staff have given their lives on the field of battle—Lieutenant-Colonel R. P. Campbell and Captain Douglas Waterston, both members of the Canadian Army Medical Corps. Lieutenant-Colonel Campbell had been connected with the hospital ever since he graduated from McGill University in 1901, as interne, medical superintendent, clinical assistant, and chief of the genito-urinary department which he had developed to a high state of efficiency. Particulars were given in the March number of the JOURNAL of a memorial fund which it is proposed to establish in memory of Dr. Campbell who had endeared himself to everyone who knew him. Captain Waterston graduated from McGill in 1914 and had barely completed his term of office as interne of the hospital when he went to the front with the 9th Field Ambulance. Among those connected with the hospital who have volunteered for active service, or are already at the front, are forty doctors, seventy-nine graduated nurses, and thirty orderlies, and many members of the staff who are unable to go overseas are doing some kind of military work at home.

During the year 1916, 8,136 admissions were made to the hospital, the total number of patients receiving treatment being 8,520. On December 31st, 1916, there were 353 patients in the hospital, and 430 died during the year. The days of treatment given aggregated 144,271, or 7,717 more than in 1915. The death rate was 5·3 per cent., or if the deaths which occurred within forty-eight hours of admission are deducted, 3·5 per cent. In the out-patient department, 129,282 consultations were given and the number of new patients treated was 26,323. The ambulance responded to 2,782 calls. In the pathological department 391 autopsies were performed and 5,656 examinations were made for the attending staff of the hospital. In the department of radiography, 9,337 skiagraphs were taken, 220 fluoroscopic examinations were made, and 300 treatments were given.

The Board accepted with regret the resignation of Sir H. Montagu Allen, who for many years has been president of the hospital and chairman of the board of management. Sir Montagu has devoted much time and energy to the furtherance of the interests of the hospital. It is probable, however, that as chairman of the British Board of Pensions he will remain in London for some time after the conclusion of the war, and therefore he felt obliged to resign. Mr. Farquhar Robertson was elected to succeed Sir Montagu as president of the hospital.

An amendment to the charter of the hospital has been secured which enables the board of management to make appointments to the staff of the hospital. In the past such appointments have been made upon the vote of the governors of the institution, an antiquated and cumbersome procedure that was distasteful to everyone concerned.

MANITOBA

A DELEGATION recently waited upon the provincial government with the request that a grant of $50,000 be made for the purpose of building an annex to the Winnipeg General Hospital for the accommodation and treatment of nervous and temporarily insane patients.

ALBERTA

THERE were reported in Lethbridge during the year 1916, 125 cases of typhoid, of which 97 developed within the city. The deaths from this disease numbered fourteen, the percentage being therefore 12·2. The deaths from all causes during the year numbered 193 as compared with 123 in 1915. An appreciable increase took place in the number of births, the figures being 420 in 1916 and 296 in 1915.

THE plans are being prepared for a new hospital at Fort McMurray, to be built by the Catholic mission there.

BRITISH COLUMBIA

THE fifteenth annual meeting of the Vancouver General Hospital was held on February 15th, in the University Building. The work of the hospital has developed enormously during the last two years and within the past twelve months its capacity has been increased by the addition of a Children's Annex in a separate building and a Convalescent Home for Incurables. In order to provide necessary accommodation for returned soldiers it has been decided to build a military hospital for the reception of soldiers from the province of British Columbia and a campaign for funds for this purpose is now being conducted. The average daily cost of maintenance per patient in the General Hospital during the year was $2.01. The financial statement showed a deficit amounting to $55,301.70, a sum which it is hoped to reduce during the present year. Over eight thousand patients were admitted to the hospital during 1916 and the number of days of treatment given was 176,941.

Four hundred and sixty-four deaths occurred, 101 taking place within forty-eight hours of admission. The total death rate was 5·6 per cent. Speaking of the work of his department, Dr. Graham director of laboratories, referred to the preparations being made to undertake work on the Lange Colloidal Gold Test. Dr. Whitelaw, director of the department of radiology, reported that 2,709 plates had been made during the year in the examination of 1,677 cases.

Dr. Arthur G. Price has been appointed medical officer of health of Victoria in succession to Dr. G. A. B. Hall, who is on active service has been granted leave of absence until the end of the war.

MEDICAL COLLEGES

Toronto University.

It is reported that in all probability the University Base Hospital will shortly leave Salonica and return to England. Lieutenant-Colonel W. B. Hendry has been in command of the unit since the departure of Colonel Roberts, who is now in charge of the Taplow Hospital.

Dalhousie University:

The Military Hospitals Commission has finally decided not to make use of the old Dalhousie Building on Carleton Street, Halifax, but to obtain accommodation for the returned convalescent soldiers at the Presbyterian College, Pinehill, near Halifax. The buildings there are on a beautiful site overlooking the waters of the North West Arm, one of the choicest spots in North America. Few students of Theology had been left this session and two of the professors had volunteered for military service about a year ago. The Commission, having decided that an additional hospital was needed, has arranged to erect temporary buildings on Camp Hill, on an excellent position on a portion of the common at Halifax.

ARMY MEDICAL SERVICES

Colonel J. T. Fotheringham, C.M.G., has accepted the appointment as Director of Medical Services to Invalids and has returned to Canada to take up his new duties at Militia Headquarters, Ottawa. He will have full charge of the medical and surgical treatment of returned soldiers.

THE following promotions in the Canadian Army Medical Corps are announced: To be temporary Lieutenant-Colonel, Major C. F. McGaffin. To be temporary Majors: Captain E. R. Selby, and Major T. P. Bradley (Canadian Militia).

IT is officially announced in the *London Gazette* that Lieutenant-Colonel George E. Armstrong, C.A.M.C., of Montreal, has relinquished his temporary commission in the Canadian Army Medical Corps.

ANNOUNCEMENT is made of the appointment of Colonel Lorne Drum as assistant medical director of the Fifth Canadian Division. Major C. A. Young, C.A.M.C., has been appointed D.D.M.S. of the Fifth Division.

CAPTAIN AMBROSE L. LOCKWOOD, R.A.M.C., was invested with the Military Cross by His Majesty the King at Buckingham Palace on January 24th for gallantry and meritorious service. When the war broke out Captain Lockwood was in Berlin taking a post-graduate course in surgery, and with him was Dr. Hepburn who was on his way home from Siam to Canada. Disguised as Americans, Drs. Lockwood and Hepburn were able to get away from Germany and, upon arriving in England, joined the R.A.M.C. During the first year of the war Captain Lockwood was attached to No. 12 Stationary Hospital, B.E.F. He then returned to Canada for a short time and has since been attached to a medical unit on the firing line. Captain Lockwood comes from Westport, Ontario, and is a graduate of McGill University.

THE Cross of the Legion of Honour has been awarded to Dr. Jules Albert Galliot of the French Army Medical Corps. Dr. Galliot, who at the time the war commenced was in practice at Notre Dame de Lourdes, Manitoba, was recalled to France and has been on active service ever since. On four occasions he has been mentioned in despatches.

THE Royal Red Cross of the Second Class has been awarded to Nursing Sisters Margaret Motherwell and Laura Holland. Miss Motherwell is the daughter of the late Canon Motherwell, of Niagara, and has been on duty in France for some time. Miss Holland was attached to the staff of a hospital at Lemnos during the Gallipoli Campaign. She is now on the nursing staff of the Canadian Hospital for Officers at Hyde Park Corner, London.

COLONEL SHILLINGTON, C.A.M.C., of Ottawa, has been given the command of the new Canadian Kitchener Hospital at Brighton, England. Colonel Shillington was A.D.M.S. at Shorncliffe and it was he who took the first Canadian medical unit to France.

IT is announced that Lieutenant-Colonel H. E. Munroe, formerly officer in command of No. 8 Canadian Stationary Hospital, has been given the command of the Canadian Military Hospital at Hastings.

MAJOR H. E. KENDALL, C.A.M.C., has been appointed to the command of No. 9 Stationary Hospital in succession to the late Lieutenant-Colonel McLeod.

THE death of Nursing Sister Constance Marie Sinclair, of Montreal, occurred at Etaples, France, on February 22nd. Miss Sinclair was attached to the Harvard unit, No. 22 General Hospital.

IT is announced that Colonel G. S. Rennie, C.A.M.C., of Hamilton, Ontario, has been appointed A.D.M.S. of the Canadian Division at Shorncliffe.

THE appointment is gazetted of Lieutenant-Colonel George MacDonald, M.D., as General Officer Commanding Military District No. 13. Colonel MacDonald was formerly in command of the 12th Mounted Rifles and returned from the front a short time ago.

THE Military Medal has been awarded to the following members of the Canadian Army Medical Corps: Sergeant E. A. Doughty and Private F. Wilson.

THE appointment is gazetted of Lieutenant-Colonel and Honorary Surgeon-General G. S. Ryerson as Honorary Colonel of the Army Medical Corps, in succession to the late Hon. Sir Frederick W. Borden.

CAPTAIN C. A. PUBLOW, C.A.M.C., of Picton, Ontario, has been appointed adjutant at the Bramshott Military Hospital. Captain Publow went overseas as medical officer of the 155th Battalion.

CASUALTIES

Wounded

Captain N. K. McIvor, C.A.M.C., of Winnipeg. Captain McIvor is a graduate of the Manitoba Medical College and was in practice at Winnipeg. He left for the front last May as second-in-command of an ambulance corps.

Captain R. M. Shaw, C.A.M.C., of Sault Ste. Marie, Ontario.

Canadian Literature

Original Contributions

Dominion Medical Monthly, January, 1917:

The protein poison in immunity and disease	Victor C. Vaughan.
Pneumonia—Successful treatment . .	A. P. Ship.
Milk and communicable disease. . .	L. R. Williams.

Medical Societies

ONTARIO MEDICAL ASSOCIATION

Thirty-Seventh Annual Meeting at Toronto, May 30th, May 31st, June 1st, 1917

Preliminary Programme

Wednesday, May 30th

10 a.m.	Meeting of Committees.
11 a.m.	Business Meeting.
12:30	Luncheon in Building.
2 p.m.	General Session. "Symposium on Venereal Diseases," Drs. Connell, Begg, Goldie, Hair, and others. Address in Gynæcology, Dr. Chipman, Montreal, "Treatment of Prolapsus Uteri."
4 p.m.	Garden Party.

8 p.m. General Session.
President's Address.
Address in Medicine, Dr. Christian, Boston, "Nephritis and Diuretics."

Thursday, May 31st

9 a.m. to 12 Meeting of Sections.
2 p.m. General Session.
Address in Surgery, Dr. W. W. Babcock, Philadelphia. "The evolution of the surgery of the Biliary System."
Laryngectomy, Dr. McKenty, New York.
3:30 Business Meeting.
4:30 Garden Party.
8:00 Evening Session.
"Recent advances in the operative treatment of Intracranial conditions," Dr. William Sharpe, New York.

Friday, June 1st

9 to 12 Section meetings.

SECTION IN GYNÆCOLOGY AND OBSTETRICS

"Demonstration of the right oblique diameter in midwifery," Dr. McCabe.

"Treatment of fibroids," Dr. Angus McKinnon.

"Ligamentous suspension with intra-abdominal treatment of cystocele in uterine prolapse," Dr. Klotz.

"Some points in the pathology of the endometrium," Dr. B. P. Watson.

"The toxæmias of pregnancy," Dr. Frawley.

"Cæsarian section," Dr. McIlwraith.

"Retained placenta," Dr. W. J. Mabee.

Other papers are promised by Dr. Holmes, Dr. Oliver, and Dr. Ernest Williams.

SECTION IN SURGERY

"Varicose veins," Dr. E. R. Secord.

"Mortality incident in surgery,", Dr. J. K. McGregor.

"Surgical treatment of gastric ulcer," Dr. D. C. Balfour.

"Post-operative treatment of abdominal cases," Dr. I. Olmsted.

"Gastric stasis, its clinical significance," Dr. W. J. McDonald.

"The cystoscope, an essential in genito-urinary surgery," Dr. Colin L. Begg.

"Exophthalmic goitre," Dr. H. Lackner.

"Surgical kidney," Dr. Mowbray.

"Suprapubic prostatectomy," Dr. N. H. Beal.

SECTION IN MEDICINE

"Gonorrheal septicæmia," Dr. Stobie.

"Blood urea," Dr. Campbell.

"Cyclic vomiting," Dr. J. Loudon.

Other papers have been promised by Drs. W. P. Caven, Minns, Bates, McPhedran and Richardson.

The Section in Ear, Eye, Nose and Throat has also arranged a good programme and exhibition of cases.

HALIFAX MEDICAL SOCIETY

THE Halifax Medical Society held its third sessional meeting on January 17th in the Victoria General Hospital, the president, Professor Fraser Harris, in the chair.

A series of very interesting cases were shown by Dr. G. H. Murphy, who exhibited skiagrams of several bone graftings carried out by him. The results were surgically important and very encouraging to workers in this field of plastic surgery.

A case of Dr. Murphy's, of chronic loculated tubercular peritonitis which had been treated by opening and draining, elicited some fruitful discussion.

The fourth meeting was held in the University Building on February 21st, when the President contributed a paper on "Some insufficiently considered aspects of the life and work of Harvey". Harvey's endeavours to scrutinize blood vessels in transparent marine creatures and in the fœtal chick having been described, the rest of the paper was mainly an analysis of the claims put forward by Italian writers to recognize Andreas Cæsalpinus (1519-1603) as the discoverer of the circulation of the blood. A number of writers contemporary with Harvey, some lay, some medical, were quoted to show that in their opinion the merit of the discovery was due exclusively to Harvey.

Professor Cameron, of the Chair of Anatomy, gave an important communication on a case of absence of the corpus callosum. The paper was illustrated by lantern slides. The brain was first seen in the dissecting room so that no clinical history was obtainable. Dr. Cameron showed that the brain in question was poorly developed as regards the depths of its sulce and the amount of its grey matter.

From an extended study of the relationship of the corpus callosum to the cerebral cortex, the author contended that according as the cortex is well developed so is the corpus callosum. Professor Cameron regards the corpus callosum as the commissure absolutely necessary for the exhibition of any degree of high mentality. He gravely questioned those accounts of the intellectual capability of persons in whom the corpus callosum is absent. The paper elicited an interesting discussion on the whole subject of the two hemispheres acting as a single percipient and intellectual mechanism.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE fifth regular meeting of the society was held Friday, December 1st, 1916, Dr. W. S. Morrow, president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. Horst Oertel.

1. Cancer of the pylorus illustrating the close relation of cancer formation to ulceration. There has been a tendency lately to emphasize the relation of ulceration to cancer formation and some have gone so far as to believe that practically all cancers of the stomach originate on the bases of old ulcers. About this there is still discussion and I myself would not unreservedly accept the statement of some surgeons that practically all cancers are due to old ulcers, because not in every instance of this combination has proof been given that the ulcer is the starting point of the cancer. Ulcerations may be secondary as a result of early vascular changes and obliterations which take place in inflamed cancers, making determination as to which is primary very difficult. But even taking these points into consideration there can be no doubt that a certain number of cancers take their origin from ulcers and the specimen which I present to-night makes this extremely probable for the reason that this stomach has several ulcers, some of which are plain and healed without cancerous transformation. Besides these healed ulcers, with a smooth perfectly plain base, there is one, large, with a deep central, crater-like excavation and fungoid edges presenting a cancerous growth.

2. The second specimen is also a cancer of the stomach showing, while itself quite characteristic and perfectly plain, a rather

unusual method and extent of metastases. They are confined entirely to the liver where they have assumed tremendous proportions, replacing most of it. It is difficult to say what determines this isolated extent of these metastases. The whole question of metastasis is by no means settled. On the whole, while we accept the idea of metastases either by lymph or the blood vessels there are still a great many points which are obscure as to the course or location, seat and extent. Where large masses of tumour tissue break directly into lymph or blood vessels they are usually distributed in the direction of, and around, the current. But what determines their seat and extent in other more obscure and irregular generalizations?

The idea occurs to me that genetic relation may be a factor. In other words those organs that are in close, early genetic relation to the organ from which the tumour grows are perhaps a more suitable soil for its metastases to grow in. The liver is really only a developmental outgrowth of the small gut and we know that tumours of the gastro-intestinal tract metastasize with predilection, even against lymph stream, in the liver. On the other hand cancers of the uterus, etc., rarely metastasize in the liver and that may be at least partly due to their much more distant genetic relation.

A detailed discussion of this matter would here be out of place, I mention it, in passing, in connexion with this, in this regard, interesting exhibit.

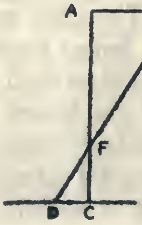
DEMONSTRATION: The localization of foreign bodies, by Dr. W. A. Wilkins.

I wish to illustrate to-night with the aid of lantern slides, a method of localization, which, although it is not a new method, is not as well known as it should be. It is a modification of the cross-thread method of localization introduced by Sir James Mackenzie Davidson when the Röentgen ray was in its infancy, and one which we found to be of very great service in France. No expensive nor cumbersome apparatus is required, and the measurements can be quickly determined by means of a pencil and paper, or read from a previously determined scale. The only special apparatus required is a flat piece of board, slightly larger than the plate which is to be used, over which two wires are stretched intersecting one another at right angles at the centre of the board.

The method of procedure is as follows: A screen examination is first made to determine the general situation of the foreign body. A small plate is placed on the cross-wire board, underneath the wires, and the tube brought into position over it. This is done by placing the centre of the target vertically over the intersection of the wires, with the long axis of the tube directly over and in the same vertical plane as one wire, and at right angles to the vertical plane of the other wire. The distance of the centre of the target from the plate is measured and noted. Any reasonable distance may be utilized, but we found that twenty inches was a practical one. The region containing the foreign body is then adjusted over the plate in such a manner that the foreign body will be as nearly as possible directly over the intersection of the wires. During this manœuvre, care must be exercised that neither the tube nor the board is disturbed. The first exposure is made and the tube is displaced horizontally a distance of three inches. This displacement may be backwards, forwards, inwards or outwards, as long as the movement maintains the distance of twenty inches from the plate, directly over one wire and at right angles to the other. The amount of displacement may be greater than or less than three inches to be satisfactory. The direction of the displacement and the distance displaced must be noted. Without disturbing the patient or changing the plate, the second exposure is made, and the plate sent to the dark room.

The purpose of the cross-wires is to enable us to have similar fixed marks on the plate and on the patient from which we can make our measurements. Before placing the patient in position, the wires are inked. When the part is laid on these wires, an impression of them is accordingly registered on the skin of the patient. The wires are so close to the plate that although two exposures are made, the effect of these exposures will appear on the plate as only one shadow of each wire.

When the plate comes out of the dark room, we proceed to work out the depth of the foreign body by triangulation, reconstructing on paper the paths of the rays and the conditions of the exposure. The other measurements are made directly from the cross-wires. The diagram will serve to illustrate this reconstruction:



"A" represents the position of the tube during the first exposure, "F" is the foreign body, and "C" the shadow of it cast on the plate, the path of the rays being represented by "AFC". "B" is the position of the tube during the second exposure, and "D" is the shadow cast by the foreign body, the path of the rays being represented by "BFD". Referring to this diagram, we have two similar right angle triangles, namely, "AFB" and "DFC", which are between the same parallels, and accordingly the base of one triangle is to the base of the other triangle, as the perpendicular height of the one is to the perpendicular height of the other. The base of the first triangle is three inches, namely the distance which the tube was displaced between the exposures. We ascertain the base of the second triangle by measuring on the plate the distance between two similar points of the two shadows. For the sake of an example, we will assume that this was found to be one quarter of an inch. We next proceed to represent in figures, the perpendicular heights, as follows: Let x represent the distance of the foreign body from the plate. Then the remainder of the distance, that is, from the foreign body to the centre of the tube, must be 20 minus x, for the total distance from the centre of the tube to the plate was 20 inches, measured before the exposure was made. The equation can be expressed algebraically as follows: the base of one triangle (3 inches), is to the base of the other triangle ($\frac{1}{4}$ inch), as the perpendicular height of the one ($20—x$), is to the perpendicular height of the other, that is,

$$3 : \tfrac{1}{4} :: 20—x : x$$
$$3\,x = \tfrac{1}{4} \text{ x } 20—x$$
$$12\,x = 20—x$$
$$13\,x = 20$$
$$x = 1\ 7\text{-}13\text{ths, or approximately } 1\tfrac{1}{2} \text{ inches.}$$

The foreign body, therefore, was approximately one and a half inches from the plate when the exposure was made, and as the plate and the skin were in close contact, it is sufficient for practical purposes to state that distance as the depth of the foreign body beneath the surface. If an interval separates the plate from the surface of the body, it must be measured and deducted from the answer obtained; for it must be remembered that the degree of separation between the shadows is dependent upon the distance the foreign body is from the plate.

Before proceeding to the other measurements, it must be stated that the two shadows of one foreign body naturally cannot represent the true position of the foreign body. To obtain this, we draw a line on the plate from one shadow of the foreign body, to the point of intersection of the shadow of the two cross-wires; and another line from a similar point of the second shadow to a point three inches (the distance the tube was displaced), inwards, outwards, upwards or downwards, depending upon the direction in which the tube was moved. Where these two lines cross, is the real position of the foreign body, and from this our other measurements are taken. Perpendiculars are dropped to each of the shadows of the cross-wires, measurements are made, and these measurements transferred to the skin of the patient, with the ink marks of the cross-wires as guides. A final mark is made on the skin to represent the spot beneath which the foreign body lies, at the depth determined.

Papers: Work in the Army Medical Corps, Canadian Expeditionary Force. Major W. H. P. Hill (to be published later). Captain D. Hingston (published in this issue).

The sixth regular meeting of the society was held Friday, December 15th, 1916, Dr. W. S. Morrow, president, in the chair.

Case Reports: 1: Diabetes in a child of three years.

2. Eczema in a child, with sudden death, by Dr. L. M. Lindsay.

These case reports were published in the February number of this Journal.

Discussion: Dr. F. M. Fry: As to the case of diabetes, the child was admitted to the Royal Victoria Hospital in July and stayed for four or five weeks. Partly owing to the training she had received at the Children's Memorial Hospital she came in sugar-free. She was certainly ill nourished and before I saw her she had been given a fairly mixed diet which on being increased gave rise to sugar in the urine. We then gave a starvation diet for a day which rendered the urine sugar free. The child remained sugar-free for some five or six days on a generous though restricted diet. At no time was there any trace of acidosis. The child maintained her weight for some time and then gained a little. It was very striking that, as has been noted elsewhere, as soon as the child had been made sugar-free the extreme appetite for solids as well as fluids ceased. With increase of diet the child for a few days was passing a moderate amount of sugar. She was removed from the hospital and until admitted to the Children's Memorial Hospital the second time was without supervision. The response to treatment in this case was very marked; nevertheless six months after the child came under observation she died. This child twice passed out of supervision and what might have occurred had we had full control remains problematical. Dr. Joslin advises seeing a bad case at least three times a day.

Dr. E. H. Mason, who made the tests in this case, found a hypogylcæmia.

As to the case with eczema I have never seen a case of sudden death in this disease, although we certainly have seen a great many cases. Of course we all know that these cases are not a pure skin disease but depend upon disturbed nutrition and metabolism of the child. I do not know how an enlarged thymus could affect the metabolism and I was wondering if it was a mere coincidence that the eczema and the enlarged thymus occurred simultaneously.

Dr. G. G. Campbell: I do not see the relation between eczema and sudden death from a large thymus in this case. We know from collected statistics of a great many hundreds of thousands of skin diseases, that eczema forms, taking all ages, 40 per cent. of the whole and that the percentage is much higher in infants than in adults. Consequently in children dying in status lymphaticus a large proportion of those having some skin disease, would have eczema. As to eczema being a disease due to malnutrition, indigestion or some general disturbance, most men who see a great deal of skin work will agree that is it very often the healthiest children, plump, fat, and apparently in absolutely good physical condition, who are great sufferers from eczema. There has never been established any relation between sudden death and the occurrence of eczema.

Paper: Functional and professional reëducation of wounded and disabled soldiers returning to civil life (illustrated with lantern slides), by Dr. E. M. von Eberts.

This paper appeared in the March number of this Journal.

The seventh regular meeting of the society was held Friday, January 5th, 1917, Dr. W. S. Morrow, president, in the chair.

Living Cases: 1. Congenital cardiac defect in a child, by Dr. H. B. Cushing.

This little boy, eight years of age, came before me this summer for the ordinary routine examination for admission to one of the institutions in the city. His aunt, who brought him, declared that he had had no sickness and was always healthy. However, on examination, I was surprised to find that there was serious trouble with his heart. After investigating more closely it became evident that the apex was over on the right side and that the dulness was decidedly over to the right. On turning to the other solid organs the liver was easily outlined over to the left side and the dulness of the spleen on the right with tympany from the stomach over to the right also. In other words, that he had a complete transposition of the viscera. To confirm this I had an *x*-ray plate taken and it shows the position of the stomach, after a bismuth meal, and the heart, liver, etc. I was interested to know whether the patient was right or left handed but he showed himself to be definitely right handed in every respect. Apart from this complete transposition of the viscera there was evident an anomaly of his heart. On putting the hand over the heart it is immediately noticeable that there is a very coarse thrill which is felt all over the præcordium, most distinctly over the third and fourth interspace about the middle of the heart; this is definitely systolic in character. On listening with the stethoscope, all over the chest but most marked over the area where the thrill is, there is a very loud systolic murmur, and this can be heard with the ear a little way from the chest. This murmur is not transmitted in any special direction and can be heard all over the chest. The pulmonary second sound, which in this case is on the right side, is accentuated. His heart is not greatly enlarged, there is a slight enlargement to the left and right laterally but no special enlargement at the base such as is found in many congenital lesions. Electro-cardiographs were taken and showed the ordinary findings which are characteristic of transposition of the viscera; that is, the first lead has an inverted picture and the second and third leads are transposed. Apart from that the tracings show nothing special except a sinus arrythmia. These two signs, the systolic thrill over the centre of the heart and the systolic murmur over the same region are, as you all know, usually taken as indicating a defect in the interventricular septum and it is probable that this is the condition of this boy. The question arises, how is it that this child shows no special involvement of his general health and development? He is almost average weight and height, as given by Holt. In running and playing with other children, however, he gets a very bright colour in his face; apparently there is a slight tendency to cyanosis.

Discussion: Dr. Maude E. Abbott: There are several points of great interest in this case. Kuchemeister has collected 125 cases of congenital dextro-cardia. Nægele distinguishes three kinds of dextro-cardia: first, dextro-versio, a simple pushing over of the heart to the right side from mechanical causes; second, congenital mirror-picture dextro-cardia, such as is seen in this child in whom all the viscera are completely transposed upon themselves. In this form the apex points to the right and is in the fifth right interspace but is formed by the left (pulmonic) ventricle; this type is associated with a directly inverted electro-cardiogram, which is here a true diagnostic feature. The third type is also a true congenital dextrocardia, but the heart is not transposed upon itself but lies on the right side of the chest, the apex pointing to the right but formed of the "right" (caval) ventricle. This type represents a simple arrest of embryonic development in which the heart retains its original embryonic position more to the right than to the left of the median line. It is usually associated with other grave cardiac anomalies and transposition of the other viscera is usually absent. The electro-cardiogram is that usually considered characteristic of congenital cardiac disease, namely, one indicating great hypertrophy of the left ventricle.

Dr. F. M. Fry: I saw this case of Dr. Cushing's in the summer and the only point upon which I would differ is the interpretation of the signs. Where the heart is on the right side and you get a murmur which is loudest over the third right space, and there, too, a thrill is best felt, I would claim that those two signs are suggestive of pulmonary stenosis. I have at present three cases of congenital defect. One a girl of fifteen, said to be well, has complete transposition of the viscera. Her heart is on the right side and there is over her pulmonary cartilage a very marked thrill which is best felt there and a murmur best heard over her third right cartilage. In the two other cases the only striking feature is a very loud long systolic murmur heard all over the heart and all over the thorax, even in the back; and in those two cases there is no thrill whatsoever and no point of maximal intensity to the murmur except over the heart as a whole, and these cases probably have a congenital defect of the interventricular septum and no pulmonary stenosis. I would ask if in this boy it may not be that the thrill and murmur are suggestive of pulmonary stenosis in addition probably to septal defect.

Dr. H. B. Cushing: I think Dr. Abbott could answer Dr. Fry better than I can as to what the condition is in this boy's heart. It seems very like a pure septal defect; the thrill and murmur, while they are over the third cartilage, are much more distinct lower down than over the centre of the heart, not the base. And again in pulmonary stenosis we usually have right-sided hypertrophy, and this case shows no evidence of this at all. For these reasons it made me think that the signs were more likely due to a septal defect.

Dr. Maude E. Abbott: I agree with Dr. Cushing in his diagnosis of this case. The conditions point much more strongly to a septal defect than a pulmonary stenosis; the localization of the thrill with maximal intensity in the fourth interspace, certainly not higher up than the third rib, is very suggestive, as is also the absence of any considerable degree of cyanosis.

2. Illustration of Exhibitor's modification of the conjunctival flap in cases of cataract extraction complicated by pyogenic infection of the conjunctival sac, by Dr. Gordon M. Byers.

Pathological Specimens: Dr. C. T. Crowdy, Royal Victoria Hospital. Tumour of the kidney.

The patient from whom these specimens were obtained was fifty-four years of age. About a year ago he developed a severe diarrhœa which continued for about four months; then he got better but it left him with what he described as "a dulness of the stomach with evolution of gas". This progressed in severity and about the first part of last August he noticed in the evenings slight œdema of the lower extremities, which disappeared in the mornings. A few weeks later this œdema became more severe and persistent and at the same time his diarrhœa recurred. On September 2nd he was admitted to the Royal Victoria Hospital in the service of Dr. W. F. Hamilton.

In his family history it is interesting to note that both his mother and grandmother are reported to have died of "malignancy of the abdomen". The patient stated that he had lost much weight, a fact which was quite evident on admission. The abdomen was very prominent and over it, particularly on the right side, there were extremely large dilated veins, which occurred from over the iliac crests up to the costal region. There was marked œdema of the lower extremities and of the scrotum. Incidentally he also had a very marked bilateral hernia and a small umbilical hernia. The abdomen on palpation was not extremely tender but was dull on percussion and gave all the signs of fluid. On careful palpation a large oval mass could be made out in the region of the right kidney. Cystoscopic examination showed that the bladder wall was inflamed. Previous to this he had given a history of having passed clots of blood in his urine. The ureters were catheterized separately and laked blood was found coming from the right ureter. The urine from the left kidney did not show anything abnormal. Dr. Hamilton diagnosed tumour of the right kidney and thrombosis of the vena cava inferior. Dr. Garrow concurred in this but did not consider the case operable and the patient remained in hospital until December 8th, gradually losing strength, and died on that day.

At autopsy a few hours later, the abdomen was found to be full of a straw-coloured fluid roughly about three litres. The liver was not unusually large and extended 7 cm. below the ensiform cartilage. In the region of the left kidney there was a large tumour mass. We dissected down on the inferior vena cava as it had been suspected that this vessel was thrombosed because of the dilated veins on the surface, etc., and it was found to be quite firm and filled by a clot. We therefore took the organs out *en masse* and dissected them out from behind.

As you can see, the right kidney is markedly enlarged and presents a nodular surface with a thickened capsule; on section it is seen filled with large nodular masses of a rather yellowish fatty appearance, which at autopsy were quiet soft. The gross appearance of the tumour suggested a so-called hypernephroma but the adrenal on this side did not show any involvement. The inferior vena cava was then opened up and it was found to be filled with a soft, stringy, rather semi-solid material, which was removed for preservation and section. In the upper part of the inferior vena cava above the liver you can still see this material in situ. On further dissection it was found that the growth extended from the kidney through the right renal vein into the inferior vena cava and the end of this plug of tissue can still be seen projecting from the renal vein into the lumen of the vena cava. One of the tumour masses evidently had ruptured into a branch of the right renal vein and in this manner the metastasis had spread. The vena cava is filled down to its bifurcation and the growth had extended into the upper portion of the right iliac where it is particularly adherent. It extended upwards posterior to the liver into the right auricle and through this in a continuous cord into the superior vena cava. While we could not trace any direct connexion through the right ventricle, we found in the lungs, particularly in the right, some of the same material in the pulmonary vessels and this could be felt as nodular masses and seen distinctly within the vessels. Besides this extension there were a number of small metastases in the liver and one also in the spleen. Interesting also is the fact that the left kidney shows no involvement whatsoever and is apparently a healthy-looking organ and had functionated very well. It is evident therefore that the inferior vena cava cannot have been completely blocked during life as the circulation of the left kidney was kept up extremely well.

Microscopical examination shows that the tumour is more properly to be regarded as an adeno-carcinoma of the kidney, and the pictures both of the tissue from the inferior vena cava and in the metastases also seem to bear this out.

Metastases from primary carcinomata of the kidney are not very extensive, and as you can see in this case the greater part was almost directly by extension through the vessels only. In the lung, besides the intravascular metastases, small intravascular nodules were found, possibly of lymphatic origin.

A detailed report on these findings will be published at a later date.

Discussion: Dr. Maude E. Abbott: There is a case in the Museum which is a duplicate of this. It occurred in Dr. Adami's service at the Royal Victoria Hospital and was diagnosed by him as hypernephroma. There was a huge tumour of the right kidney with extension into the inferior vena cava and right auricle of the heart. The inferior vena cava was thrombosed below and plugged above by a firm tumour mass, not as in this case a loose mass, but very firm about 3 cm. in diameter and extending up into the heart, making a scar of adhesion on the wall of the left auricle where the two surfaces had been broken apart.

Papers: 1. Subacute combined sclerosis, by Dr. G. S. Mundie.

This paper appears on page 311 of this issue.

Discussion: Dr. A. G. Morphy: Dr. Mundie has not left much to be said on the subject of combined sclerosis. I would like to add my own testimony to his with regard to the necessity of noting carefully the symptoms which are so often put down to neurasthenia—the numbness, tingling, drowsiness, etc. It would be very interesting to follow up these cases from month to month; unfortunately they disappear from view and we lose sight of them. As regards the diagnosis, so far I have not found it an easy matter or as comparatively easy as Dr. Mundie would lead us to believe. It requires a great deal of care and the experience from having seen a great number of cases. In some cases, of course, it is comparatively easy, but if you have a case in which there is no Babinsky but there is Romberg and ataxia, it might be very easily confounded with tabes. In Case No. 3, the patient had rheumatism, so-called, in the legs, ataxia, difficulty in walking, the reflexes were absent and there was no Babinsky. Such a case, even in the absence of Argyl-Robertson pupil, might easily be confounded with tabes.

Dr. W. E. Enright: I had the fortune to have one of these cases under my charge for a time and it is of considerable interest to me to hear the ultimate history. Although a blood examination showed no marked anæmia the patient had all the appearances of a well marked anæmia; he was a tailor by trade and seemed to think that his condition had been brought on by his occupation. The immediate onset was caused by a holiday celebration shortly after the Christmas and New Year holidays and began after participation in some Scotch dances. He felt that his condition was due to this unusual activity. Despite treatment the condition did not clear up. Noting the anæmia I prescribed iron and strychnia and he really appeared to be doing well on this for a while. However, it as not for long, and as I had a suspicion of tabes I referred him to Dr. Mundie who soon cleared up the diagnosis; but the case went on to a fatal termination. He suffered a great deal mentally during the progress of the disease.

2. Observations on wounds of the abdomen at a casualty clearing hospital, by Major E. W. Archibald.

This paper appears on page 298 of this number of the JOURNAL.

DISCUSSION: Lieut.-Col. A. MacKenzie Forbes: I am glad that I have had the privilege of hearing Major Archibald, as I am particularly interested in war surgery. Unfortunately, however, I have had very little experience in abdominal surgery in the war zone, as in France I was always situated on the lines of communication, and there you see more of the surgery of the bones, joints, etc. I have always been very ambitious to go to a casualty clearing station where you see the surgery pictured by Major Archibald. To show you how rare are abdominal lesions in the hospitals on the lines of communication I may say that I was personally interested in a few more than 2,500 patients in France and of these I can recall only seven as being abdominal injuries. All other abdominal cases had either died at the front or been cured in the casualty clearing stations. The abdominal wounds which I saw were in the convalescent stage and only one was of particular interest. This patient had an oblique wound in the abdomen penetrating the peritoneal cavity. According to the history which was received from the front with this soldier, the first part of the small bowel had been penetrated by a projectile necessitating the excision of several inches of the injured jejunum at a casualty clearing station. The patient got along very well for some time. He then unfortuately developed some pulmonary symptoms which Lieutenant-Colonel F. G. Finley diagnosed as being due to an abscess of the lung, from which the patient eventually died. The bullet apparently had entered the abdomen, gone through the upper part of the jejunum into the thorax and had lodged in the lung apparently without having produced symptoms.

Here it remained for some weeks and only eventually caused an abscess of that organ. Abdominal cases are all attended to at the front and as one gets nearer the base the proportion is smaller and smaller, till at the base hospitals they are seen but rarely.

Major E. W. Archibald: Dr. Lauterman asked concerning the effect of adrenalin, camphor and other stimulants in cases of shock; we tried these rather faithfully, and found them in cases of severe shock of no value; in light shock they did seem to do good but as we always combined these with an intravenous salt infusion, it was difficult to tell to which remedy the good effect was due. What interested me particularly in the question of shock was the problem of combating the severer grades of the condition. If one could make certain of the exact cause of shock we would possibly be able to institute a proper remedy. I tried amyl nitrate in two cases on the theory that shock is a spasm of the peripheral arterioles. I tried the head-low position frequently, without effect. I tried massage of the abdomen in one case—rather deep pressure kept up (rhythmically) for ten minutes at a time over an hour and a half with short intervals, apparently without effect, hoping that the collection of blood in the splanchnic veins might be forced on to the heart. I thought of trying a see-saw movement, by which the patient's head would be alternately lowered and raised, with the same idea of forwarding the abdominal blood by means of gravity; but it seemed obvious that that was doomed to disappointment from the fact that the head-low position accomplished nothing. Intravenous salt solution we faithfully tried, it nearly always made an impalpable pulse palpable, or a fluttering pulse half respectable; it frequently raised blood pressure from 40 say up to 75 or 80, but its effects were transitory and the patient would fall back into his previous state inside of an hour or less. I tried gelatin, 25 grams to the litre of salt solution, with the idea of giving to the blood a substance of a colloid nature such as is the blood itself. That held the blood pressure up very much longer than the pure saline, frequently from four to six or eight hours, but the ultimate result was not changed. All these things were tried in an effort to combat severe shock; but the key to this problem has yet to be found.

With regard to Dr. Hall's question as to the effect of morphine on acidosis, I am very sorry to say that we never carried out urinary tests of that sort, or indeed many of any sort. We were only six men and with a convoy of 125 to 200 at a time, it was pretty steady mechanical work, doing dressings, operating, cleaning up generally; so that for this and other fine details we did not have the time, save only for blood pressure records which we took faithfully.

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REMOTE SYMPTOMS FROM LESIONS OF THE PROSTATE AND DEEP URETHRA

By Thomas McCrae, M.D., F.R.C.P.

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RECENT years have seen a marked increase in our knowledge of the surgical aspects of diseases of the prostate, seminal vesicles, and deep urethra, but appreciation of the medical aspects of these lesions has not been as keen. In diagnosis we have to remember always that the situation of symptoms and that of the causal lesion may be far apart. We all make errors through forgetting this and not least among them is neglect to consider disease of the prostate and adjacent structures as a possible cause for disturbance elsewhere and perhaps far removed. With symptoms suggesting disturbance in the urinary tract or in the sexual sphere, there is an immediate suggestion of local trouble and examination of the genito-urinary tract follows. In many cases there are no local symptoms which direct attention to the site of the lesion and it is to these that attention is directed in this article.

In the discussion of the remote effects of lesions of the prostate and deep urethra as they concern the problems of internal medicine, it is convenient to make a distinction between the organic and functional lesions. In using the word functional in this connexion, we must remember that functional disturbance of one organ may be due to organic disease elsewhere. In causing functional disturbances, alterations in the deep urethra and verumontanum are perhaps as important as prostatic disease, as they are more likely to cause disturbances in the sexual sphere and this in turn is often followed by what may be called neurasthenia. As regards the causation of organic disease the prostate and seminal vesicles are the more important, more particularly because the infected pros-

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tate or seminal vesicles may act as any other focus of infection. Any of the results of such a focus may follow, of which myocarditis and arthritis are possibly the most important. Such a condition may be regarded as "pelvic inflammatory disease" in the male and in many ways is as important as this condition in the other sex. In the causation of referred pain either the prostate or deep urethra may be responsible; in fact they are often associated.

In a previous communication* some of the phases of this subject were discussed and further experience has served to emphasize the importance and frequency of disturbances at a distance due to lesions of the prostate and deep urethra. When the disease gives definite local symptoms or signs referred to the genito-urinary tract, attention is directed there and the diagnosis should not be difficult. But in the patients in whom there is no suggestion of any local disease, we are likely to fix our attention on the features which seem essential from the patient's point of view and fail to recognize the source.

I should first like to draw attention to the frequency with which disturbance of the general nervous system in the male may be due to such local disease. The history of an illustrative case may help to bring out some of the points.

Case 1. The patient, aged twenty-eight, single, held a responsible position in a large business. His employer stated that the patient had been losing in efficiency for sometime and that if this continued he would be compelled to discharge him, which he was much adverse to doing. The problem was to try and discover what was the cause of the inefficiency. The employer was confident that alcohol was not responsible, but had no suggestion as to any definite cause.

The patient himself was very frank and said that he did not know what was wrong, but felt that something serious was the matter. He realized that he was not doing his work as well as previously, he became more easily tired and found that in business interviews he did not have his usual keenness. He showed anxiety as a prominent feature. He gave an instance in a business trip to New York which he had taken the day before. On the journey over he dreaded the interview and felt convinced that he would make a mess of it. He was quite conscious of his lowered efficiency but completely puzzled as to any explanation for it. His condition had gradually grown worse and he had been much depressed at times. The history did not throw any special light on the condition, as he had been very healthy. There was no history of any thoracic or abdominal disease. He had used tobacco moderately but had never taken alcohol. There was no history of any venereal disease. His work has entailed heavy responsibility, but formerly he rather welcomed this and felt that he could handle any situation which would arise.

He did not know when he first began to notice that his efficiency was less, but certainly for a period of over a year he had not the usual grasp on his work and the same ability to do it well. He had slept well and had not lost weight. He had devoted the majority of his evenings to reading and study but the ability to concentrate had gradually diminished and now he was able to read for a short time only.

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*McCrae, T., "The Remote Effects of Lesions of the Prostate and Deep Urethra." *Jour. Am. Med. Assn.*, 1913, lxi, 477.

This history did not suggest any clue as to the cause of his condition. Before seeing him I had thought that possibly the patient was in a position which was too big for him, that he had been going beyond his strength in trying to fulfil its demands, and worn himself out nervously. But the impression made by the patient did not bear this out and it was evident that there was some other cause. Naturally the possibility of a latent tuberculosis or of hyperthyroidism came to mind.

On examination the patient looked very well. There was considerable tremor of the eye-lids and tongue, and increase of the reflexes generally. There was no enlargement of the thyroid and the lungs and circulatory system seemed absolutely clear. It was only a routine examination which showed that there was enlargement of the prostate, which was decidedly tender, and inflammation of the deep urethra and verumontanum. There was no history of disturbance in the sexual sphere and at first I had some doubt as to how much part the local lesion played in causing the general condition. However, local measures were definitely indicated and treatment resulted in a marked change. Within three months the patient's condition was decidedly improved. At the present time (a year later) he is absolutely well and I have found on inquiry from his employer that he is quite back to his former efficiency.

You may well ask the why of this but it is not easy to answer. This patient had a general neurosis which had impaired his efficiency and was progressive. A local lesion was found and corrected with an immediate result. They may not be cause and effect but it is difficult to explain the situation in any other way. He had no treatment other than the local measures as I wished to see the result without any reason to attribute it to other means. If there is disturbance in the sexual sphere it is easy to understand the reason for a general neurosis, but in this patient so far as could be found this had not occurred.

It is interesting to speculate as to the reason for such general disturbance being due to a local lesion and one which seemingly gave no local disturbance. Must we regard such a patient as one with little resistance, one in whom any slight disturbance is enough to cause marked upsetting of the general nervous system? Is there perhaps an internal secretion from the prostate, alteration of which means widespread disturbance of glandular balance? Is it perhaps entirely a matter of a focus of infection? We must acknowledge our ignorance of the answer.

It is only necessary to refer to the difference which the recognition of lesions of the prostate and deep urethra has made in the management of the group sometimes termed sexual neurasthenics, to appreciate the importance of these local disturbances. These patients used to be the terror of every medical clinic, but we very rarely see them now, or at any rate only long enough to make a general study. They do not come back month after month with their accounts of symptoms to which too little attention was given. For this change the medical and neurological clinics owe deep gratitude to the genito-urinary surgeons. The importance of local lesions in the ætiology of this group is well recognized but it is not well to expect that treatment of the local lesion will make a degenerate nervous system sound. In some of these patients the psychic disturbance is permanent and nothing can have much influence on it. In the majority of them some form of psychotherapy should go with local measures.

One feature which rather stands out in the symptoms of these patients with general nervous disturbance is the frequency and prominence of *anxiety*. This was manifested in the history already given and is particularly demonstrated in patients who have symptoms referred to the heart. These are varied in character and may change from time to time; palpitation, tachycardia, feelings of uneasiness and distress, perhaps even actual pain, may be present. In several patients the attacks of pain were so severe that the diagnosis of angina pectoris had been made. This is probably comparable to similar symptoms in the other sex associated with disturbance in the sexual sphere.

In every patient with symptoms of a general neurosis we all agree on the importance of determining the presence or absence of any local disease. Many such cases are really due to an early tuberculosis or hyperthyroidism, or a focal infection—for example in the mouth—may be responsible. The existence of prostatitis or infection of the seminal vesicles may be regarded as operating like any other focal infection and it may have an influence as such. However, there is probably something more in many cases but how this acts is difficult to explain.

Organic conditions resulting from prostatic disease. Of particular interest is the ætiological relation to myocarditis. In the causation of this the influence of infection is well recognized. Undoubtedly the source is the prostate in some cases. Evidently in an elderly man with arterio-sclerosis there are other factors, but the special importance of this particular lesion lies often in the decision as to operation. The prostate may be responsible as a focus of infection and because of its interference with proper urinary drainage keeping up an infection of the urinary tract. Operation may be advised against on account of the state of the heart and yet the removal of the prostate may be the only thing which offers hope of improving the cardiac condition. The problem as to how much part each factor plays is not easily answered, but the rapid improvement in the circulation after removal of the prostate is often striking. A somewhat similar problem may concern the kidney with prostatic obstruction and marked back pressure on the kidney, the clinical picture of which may suggest a chronic nephritis perhaps with uræmia. It is essential to decide whether the condition is the end stage of a chronic nephritis or is the result of prostatic enlargement. The outlook depends often on a correct diagnosis. Proper treatment in the latter condition offers much but is not likely to be carried out unless there is a full realization of the part played by the prostate.

It is evident that as regards the circulatory system a focus of infection in the prostate or seminal vesicles may act exactly like a focus anywhere else. I have seen one patient in whom prostatic infection was apparently responsible for a phlebitis. The particulars are as follows:

Case 2. The patient, aged forty-eight, came complaining of phlebitis. In the past history there was a note of typhoid fever at the age of twenty, some attacks of influenza, but no other history of acute disease. There was an indefinite history of a sore, which possibly was syphilitic, twenty years before. He took treatment vigorously for a period of a year and a half. He had an attack of gonorrhœa at the age of twenty. He used alcohol moderately.

The phlebitis began in May, 1912, with pain and soreness in the calf of the left leg, which seemed to be deep seated and was worse on walking. There was slight fever for perhaps a week, but little if any swelling at this time. The condition improved with rest, but a short time afterwards he apparently had a severe illness, the exact details of which he did not know. He was in bed for four weeks and was told that he had high fever. Agglutination tests for typhoid and paratyphoid fever were negative. After six weeks he gradually improved and was able to get about. He then began to have pain in the femoral region of the left leg, with very definite signs of phlebitis. Shortly afterwards there was involvement of the right leg with swelling, considerable pain, but not much redness. This condition continued until the time when I saw him in October, 1912.

The patient was a very healthy, well nourished man, the temperature varied from 99° to 100°, the lungs were clear but the heart was slightly enlarged and somewhat irregular. The blood pressure was 130. The leucocytes were 14,000. The Wassermann reaction was negative. Both legs showed marked swelling with more in the left. There was a hard brawny œdema, such as one sees after phlebitis has continued for sometime. There was no special tenderness over the veins, which were somewhat but not extremely enlarged. On the inner surface of the left thigh there was an area of redness which suggested lymphangitis. The fact that the inflammatory condition in the veins was so persistent suggested some permanent source of infection. The ordinary examination did not show any local area which would be regarded as responsible, but examination of the prostate showed enlargement with some tenderness. The secretion contained a considerable number of pus cells. One seminal vesicle was enlarged and tender. As this seemed the only evident source of infection, persistent treatment was advised and the result of this was that the patient improved rapidly and steadily and became practically well. The phlebitis apparently subsided, the swelling in the legs disappeared and he was free from pain. I saw him again about four months after the first consultation and found his general condition excellent. There was very slight œdema of the legs after he had been walking or standing for some time, but this disappeared promptly with rest. The surface veins were slightly distended, but could not be described as varicose.

Six months later he reported that the condition was much the same and that he suffered very little from pain or disability. As he felt so much better he had given up the local treatment of the prostate and had resumed the use of alcohol, both against strong advice. After this the acute condition returned again, but not in such a severe form that the patient was compelled to give up and he persisted in keeping about and would not resume the local treatment. No accurate notes were obtained as to the exact condition after this, but it was learned that he died suddenly some time afterwards apparently from embolism.

Remarks. Naturally it is not possible to be absolutely sure that the phlebitis was the result of the prostatic infection, but this was the only focus which could be found. The improvement in the phlebitis was marked with improvement in the local condition. When the latter was neglected and became worse the phlebitis returned. At any rate it seems a fair inference that the two were associated.

Arthritis. A large proportion of cases of arthritis are secondary to a focus of infection and in the male the prostate and seminal vesicles should not be overlooked in the search for this. In this connexion the seminal vesicles are particularly important. We may wonder that a local infection may be latent and not cause any local disturbance but there is a parallel condition in the teeth. A focus of infection at the root of a tooth may exist for years without any local symptoms. A considerable proportion of cases of arthritis of the spine appear to be secondary to prostatic and vesicle infection. In every patient with spondylitis pelvic infection should be carefully excluded.

Referred Pains. Of particular interest is the frequency with which referred pains occur secondary to these local lesions. It is not very rare for pain to be referred to the region of the kidney with features suggestive of renal colic and in a number of such cases a needless operation has been done. Young has directed particular attention to the importance of this point. There does not seem much excuse for mistake in these cases as the symptoms definitely direct attention to the urinary tract. It is very different, however, when the pains are referred to other regions and it may be said that no region from the waist down is necessarily spared. In a certain number of cases the pain is referred upwards and it felt particularly in the back or in the abdomen. An instance of this is as follows:

Case 3. The patient, aged twenty-five, was seen in consultation with Dr. M. Green. He complained of pain in the back and abdomen, the latter being particularly on the right side. As two of his near relations had died of renal tuberculosis he thought that this was the explanation of his symptoms. The past history was comparatively negative. He had not had any severe acute infection and, except for an operation for appendicitis three years before, had always been well. There was no history of any venereal infection and he had not used alcohol.

The present illness dated back about six months. At first he complained of pain in the lower back, which was not severe and in the early stages was felt irregularly with intervals of a week or longer between. After two or three months the pain in the back became more constant and he began to suffer from pain in the right abdomen. This soon became more or less constant, was generally worse in the afternoon and had no apparent association with any activity or fatigue. He was quite comfortable if he was lying down and had no discomfort in the morning until he got up. The pain never waked him at night When asked to indicate the points of most severe pain he pointed to the sacrum and to the lower right quadrant of the abdomen. His general health had suffered as he was rarely free of some pain and was always worried about it. The patient volunteered the information that his nervous system was considerably affected and that he felt much less able to do his work.

The general examination showed very little abnormal, the pupils were widely dilated, the reflexes were increased and there was marked dermatographia. The heart and lungs were clear. There was tenderness on palpation in the right side of the abdomen, apparently due to the cæcum being distended. Examination of the back did not show anything abnormal, the movements were perfectly free, and there was nothing to suggest spondylitis. Examination of the prostate showed that it was considerably enlarged and markedly tender, with the seminal vesicles also involved, one beng considerably enlarged and very tender. There was distinct tenderness on pressure over the deep urethra. A further examination showed that the verumontanum was inflamed and extremely tender. A point of some importance was that after rectal examination and pressure on the prostate the patient suddenly cried out that the severe pain in the region of the sacrum had returned, no doubt due to the examination. There was no question of the genuine character of the pain.

Remarks. It is evident that in such a case as this we cannot hope to carry out any proper therapy until a diagnosis is made of the cause. This patient had consulted many physicians and had been given various diagnoses, in which of course "rheumatism" figured often. The giving of sedative drugs had resulted in some temporary relief but did nothing more than this. The patient made no complaint of any symptoms that would direct attention to the local trouble, and there was nothing to suggest disturbance in the urinary system or sexual sphere. Such a case emphasizes the importance of knowing what a variety of pains may result from prostatic disease and also the wisdom of a routine examination.

The areas to which pain may be referred are many. Pain in the back is not infrequent, especially in the lumbar region. As is true of the majority of these referred pains it is usually much more marked on one side than the other and the distribution is rarely symmetrical. The symptoms may suggest the possibility of spondylitis. This uneven distribution is also true of pain referred to the abdomen which sometimes suggests visceral disease there. In the previous article a case was reported in which very severe paroxysms of abdominal pain, from which the patient suffered, could be brought on by touching the inflamed verumontanum through the urethroscope. In other cases the pain is referred to the greater trochanter, to the sacro-iliac joint or to the sacrum. Occasionally the site is the rectum, the pain being described as apparently situated about the middle of the rectum. Particular importance should be given to pain referred to the sciatic nerve. There are many causes for "sciatica" and the ætiological diagnosis is often a matter of difficulty. The possibility of the prostate being responsible should always be considered. It is usually easy to prove or disprove this. In a patient with sciatica seen recently there was disease of the sacro-iliac joint and chronic prostatitis. The question arose as to which was responsible. Fixation of the joint resulted in a rapid improvement in the sciatica, the prostate was not responsible.

There is no desire to suggest that every obscure pain "below the belt" in the male is due to "pelvic disease". But it is important to emphasize that a certain number of them come from this cause and that unless it is known and looked for, a definite ætiological diagnosis is not likely. To put a man to bed who has sciatica is good therapeutics up to a certain point, but it is poor treatment if a cause which can be corrected is left alone.

Another result of prostatic and seminal vesicle infection is fibrositis. This is responsible for many of the obscure and persistent pains often designated rheumatism or neuritis. In these cases the symptoms are the result of a local focus of infection.

In this article no reference is made to the usual symptoms and signs of prostatic, seminal vesicle and deep urethral disease. These are well known. It is on the need of search in what may be called latent cases, in so far as local symptoms are concerned, that emphasis is placed. The diagnosis is easy if a proper examination is made. A rectal examination is usually enough to determine the presence of disease of the prostate and seminal vesicles. The use of the urethroscope may be required to decide as to disease of the deep urethra and verumontanum. One point in reference to the ætiology of these infections may be noted. They are not necessarily the result of a gonococcus infection. Many of the profession have the idea that a negative history as concerns gonorrhœa excludes the possibility of prostatic infection. This is not the case and in many cases the infection is probably from the blood or urine. Acute prostatitis may occur with an acute infectious disease and become chronic. A variety of organisms may be concerned. Another erroneous idea is that prostatic disease does not occur except in advanced life; it is well to realize that its occurrence in young adults is not uncommon.

The chief duties of a consultant were described, by one who is himself a celebrated consultant, as two, viz.: "To give as cheerful a prognosis as the circumstances of the case permit and, second, to make a rectal examination." The importance and frequency of prostatic disease as a cause of obscure symptoms renders the second duty an especially important one.

DIAGNOSIS OF TUMOURS IN THE UPPER ZONE OF THE ABDOMEN

By Alexander McPhedran, M.D.

THE term tumour is used to designate any kind of abnormal mass and also any normal structure in an abnormal position. In the examination of the upper zone, it is of the utmost moment that the patient lie in a comfortable position, squarely on the back, with shoulders raised on one or two pillows, and directly facing a good light, so that nothing abnormal escapes the eye. Inspection should then be made first, while the patient lies at rest, and after that, while deep inspirations are made in order to show any signs of masses moving beneath the abdominal wall, especially of such as may lie under cover of the costal structures and are forced downwards in deep breathing. The want of observance of these simple rules has misled the most capable physicians.

In the left flank the great majority of tumours are connected with either the left kidney or the spleen. The normal *kidney* is frequently prolapsed, occasionally it is wandering and movable over a wide area in the abdominal cavity. If it is simply prolapsed, it lies on the posterior wall of the flank, and on light pressure it disappears with distinct "slip" into its normal position. The wandering kidney usually is also easily replaced. The enlarged kidney lies on the posterior wall of the flank, filling it from the outer wall to the spinal column, and, if not adherent, can be lifted forwards on the points of the fingers. If not much enlarged, it may be pushed up into its normal position. As it enlarges, the flank posteriorly and laterally becomes filled out and rounded, but never bulging. If the flank bulges, it is due to a new growth or an abscess. As the kidney enlarges, it comes nearer the anterior abdominal wall and into contact with it at or above the umbilical horizontal line. The colon is in front of the outer part. It is often reported to be in front of the inner part of the kidney and passing outwards to the outer part as it descends. By pressure with the fingers obliquely, the anterior wall of the colon can be felt in some cases to rub over the posterior.

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If the mass is not too large, the small bowel may lie in front of it. It may descend in inspiration, but much less so than do organs which are in contact with the diaphragm. The kidney mass always retains its normal shape. It may cause varicocele from pressure on the vessels in the posterior part of the abdomen.

The *spleen* may also be wandering and found in various parts of the abdomen. When it enlarges, it descends in close contact with the abdominal wall, carrying the splenic flexure of the colon ahead of it, and as its size increases, it moves the colon further and further inwards towards the middle line. The position of the colon in relationship to either the kidney or spleen is best determined by its inflation with air, the distension of the colon being followed upwards by the aid of the stethoscope. The enlarged spleen fills the flank outwardly and may fill it posteriorly also, but only in the external part, not extending inwards to the spine, but leaving a space into which the fingers may be dipped with gentle pressure and which is also more or less resonant to percussion. The exceptions to this rule, if they occur, are rare. The spleen moves freely in respiration. Its outline is definite, its margin being firm, unless it is of rapid growth, when it may be somewhat soft. If the abdominal wall is relaxed and thin, the fingers may be pressed underneath its lower end. One or two notches may be felt in its inner margin, but in many cases they are not to be found. It never causes varicocele.

CASE 1. A young man entered into the hospital in 1916, owing to weakness and loss of weight. He was very pale and in his left flank there was a moderate sized tumour, filling the outer part and the posterior part externally. It moved freely in respiration and in front descended about two inches below the costal margin. Its shape was very irregular and the increase in size appeared to be due to the formation of masses in its substance. Between its posterior inner margin and the spine there was a well-defined space that was soft, contained no mass and was slightly tympanitic on percussion.

This is a good illustration of the difference between a renal mass and that formed by the spleen.

CASE 2. A boy aged thirteen seen some years ago had had hæmaturia for some time. He was pale, moderately œdematous and showed a definite fullness in the left flank in all directions, due to a firm mass filling the flank anteriorly, laterally, and posteriorly. There seemed no room to doubt the presence of a large renal tumour. An operation was advised.

The surgeons who saw him, believed the tumour to be an enlarged spleen. The mass was found to consist of the spleen lying on a large kidney. Inflation of the colon would have proved the existence of the spleen and the firm mass filling the whole flank inwards to the spine should have made the existence of a large kidney all but certain. In the right flank, the kidney is to be differentiated from an abnormal process of the liver. Occasionally an enlarged gall-bladder with a long pedicle falls into the right flank. What has been said of the left kidney applies also to the right—it lies on the posterior wall of the flank extending from the outer wall to the spine, with the colon in front. If not too large, it can be made to disappear behind the liver with light pressure. A liver process lies against the other flank, outside the colon, and does not fill the flank posteriorly, and usually the kidney can be felt to descend in inspiration behind the liver. A liver process can usually be traced upwards and found continuous with the liver. With care, error in the diagnosis between the two should rarely occur, if careful examination has been made. That error may occur is shown by the following:

Case 3. A young woman, pregnant five months, was suffering from grave septic poisoning, with some pyuria; a tumour in the right flank was regarded as an enlarged septic kidney; an operation for its removal was proposed. On careful examination, however, it was pointed out that the tumour was continuous with the liver, that the colon was inside of it and that the kidney could be found descending in the posterior flank in inspiration. An operation was done and the conditions were found as above described.

In some cases rotation of the liver causes its right extremity to appear in the right flank. Such a condition was found in an infant with acute abdominal symptoms, thought to be due probably to an appenditicis. The appendix was found healthy, but there was blood-stained serum in the peritoneal cavity, which was thought to arise from hæmorrhagic pancreatitis. Such was proved to be the case at autopsy.

Tongue-lobes of the liver may project from any part of its lower border or under surface. They vary greatly in shape and size; usually they are broad and short, sometimes narrow and very long. If they are continuous with the margin of the liver, they are usually recognized with ease, if we are on our guard; but if there is a deep groove at their junction with the liver, or if they project from its under concave surface, it may be impossible to differentiate them from an enlarged gall bladder, an hydatid cyst or new growth adherent to the liver. In rare cases, larger or smaller parts of the liver are met with, which are almost completely cut off from the main body, apparently from long-continued pressure of the corset or of a constricting band. The mass may be so freely movable as to elude detection on examination.

Nodules in cirrhosis of the liver are occasionally quite easily felt at or below the costal margin. There may be difficulty in distinguishing them from carcinomatous nodules. Sir William Jenner said they were never larger than a cherry. Cancerous nodules are usually larger when discovered and some of them found umbilicated.

Of tumours of the liver the most frequent is carcinoma. There is generally enlargement of the liver and some hardening. They often grow very rapidly and the liver may become enormously enlarged. Nodules if they appear may be umbilicated. Pain in front and back is common. Jaundice occurs in about half the cases, is marked and continues to increase, the skin becoming a dirty green hue. Ascites is frequent.

Syphilis may cause gummas in the liver; they sometimes attain a large size. Surrounding them is a more or less extensive formation of fibrous tissue. If a gumma softens and is absorbed, the fibrous tissue contracts, causing a depressed scar, and the surrounding liver undergoes compensatory hypertrophy, and therefore becomes more prominent, and thus the scar depression will simulate an umbilication; at the same time the liver may be the seat of lardaceous deposit, causing it to enlarge as greatly, but not as rapidly as a cancerous liver. In rare cases there is also jaundice from obstruction but it never becomes the dirty-green hue of cancer.

Tumours of the pancreas may form in any part of the gland. The most common is carcinoma of the head of pancreas. Chronic inflammation may cause a mass indistinguishable from cancer of the head of the gland. Cyst is more common than a solid tumour; it often results from acute pancreatitis. In some cases the foramen of Winslow becomes closed and an accumulation of serous fluid in the lesser peritoneal cavity may occur and form a cyst indistinguishable from one of the pancreas. The relation of the stomach and transverse colon to a pancreatic cyst varies: (1) The cyst may project above the stomach; (2) The stomach may lie in front, the colon being below; (3) The stomach usually lies above and the colon below the cyst; (4) The colon may lie in front; and, (5) Both stomach and colon may lie above, the cyst projecting forwards and downwards, appearing at or below the umbilicus.

Case 4. The following illustration may be given: A man of fifty years had an acute pancreatitis, with the usual symptoms of the sudden onset of pain in the epigastrium, followed by vomiting and collapse. Recovery took place in a few days. Some weeks later, swelling began in the epigastrium and increased so that in a few weeks it greatly distended the abdomen. It was supposed to be a cyst of the pancreas; in operation accumulation of serum in the peritoneal cavity was found and at the bottom of the cavity round smooth nodules were found, and were regarded as probably cancerous. Recovery quickly followed and the man resumed his business. Swelling of the epigastrium recurred and increased to a very large size, again necessitating operation. This time the cyst was no doubt pancreatic, the contents being similar to the secretion of the gland. The fluid discharged freely for many months and kept the surface around the sinus constantly raw. The cyst gradually contracted and in time the sinus closed, with recovery. In this case the stomach was above, the colon below the cyst.

In a case recently seen with Dr. F. N. G. Starr, a very large cyst-like mass occupied the upper abdomen down to the umbilicus, extending on each side to the mid-clavicular line, and prominent anteriorly. It appeared to be a cyst of the pancreas or serous distension of the lesser peritoneal cavity, although it extended laterally rather much for either. On exposure, it presented a tense dark, mottled mass and proved to be a hypernephroma growing from a suprarenal "rest" in the falciform ligament of the liver.

Gastric tumours are most frequently pyloric. They are usually small and firm. In the early stages before adhesions occur they are freely movable, sometimes over a wide area in the abdomen. The gastric peristalsis may be so active that the mass may be felt apparently to harden under the hand. This is probably due to tension at the end of the stomach, rather than a hardening of the tumour. In such cases the tumour is usually non-malignant, although cancer may have begun to form in it. Tumours may form in any part of the stomach. They can usually be demonstrated by inflation, or better by *x*-ray examination, to be in connexion with it.

Tumours formed by the gall bladder are usually readily diagnosed—they are fixed to the liver, move with it, are usually separated from it by a groove, are movable laterally in most cases and abdominal tympany is below them. An hydatid cyst closely resembles the gall bladder, but is it usually immovable, being firmly adherent to the liver, grows slowly without symptoms, being accidentally discovered when it attains a large size. It is smooth and painless. It may form in the position of the gall bladder. It is usually single, but there may be two or more. I saw a woman in a London hospital in whose abdomen there were a great number of smooth, rounded, adherent, painless hydatid masses. She required tapping from time to time for the removal of copious ascitic effusion.

Retraction of thickened omentum occurs in some cases of tuberculous peritonitis. The nodular mass extends across the epigastrium, is fixed by adhesions and may resemble a nodular lower border of the liver. A tympanitic space is usually found between it and the liver and serves to prevent the error.

Fæcal masses in the flexures of the colon and in the transverse colon may be misleading; a copious enema usually removes them. Tumour of the colon or a polypus in its cavity are occasionally met with. There will be some blood and mucous in the stools from time to time indicating the seat of trouble. Inflation may determine the relationship of the tumour to the colon and settle the difficulty.

Aneurism of the aorta or one of its branches sometimes occurs. Aneurism of the aorta forms an oval or round tumour, which can be grasped and felt to pulsate in all directions. Aneurism of the hepatic artery is very rare; most frequent in males. It may be due to infection of its wall from without. As in aneurisms elsewhere, syphilis may probably be the most common cause. It has never been made out during life except in laparotomy. Its chief symptoms are pain, hæmorrhage and jaundice, but these occur also in ulcer of the stomach and duodenum, and pain and jaundice in biliary colic. If all these can be excluded, aneurism may be suspected.

AT a special meeting of the Council of Physicians and Surgeons of New Brunswick, held in St. John on the twenty-second of March, the resignation of Stewart Skinner, M.B., as registrar of the Council was accepted. Dr. Skinner is leaving for overseas. John S. Bentley, M.D., of St. John, was elected as Dr. Skinner's successor.

THE ACUTE ABDOMEN

By F. N. G. Starr, M.B. (Tor.)

Associate Professor of Clinical Surgery, University of Toronto

> **"Whatsoever thy hand findeth to do, do it with thy might"—**
> **but let it be mighty gentle!**

SO often I have been asked why, just before opening the abdomen, I make a careful palpation, that it occurred to me it might be interesting to take as "my text", The Acute Abdomen, for it is in such cases that preliminary palpation under anæsthesia is of so much value.

If one accustoms oneself to an examination of the flaccid abdomen under anæsthesia, he will be astonished at the valuable information he will secure as a guide often to future conduct. Take for example our ever constant friend, the acute appendix. Some surgeons use as a routine, the near midline incision, some the right rectus incision, and some the McBurney-McArthur, or split muscle incision. It frequently occurs that under the anæsthetic one can locate accurately where the acutely inflamed appendix lies; hence, why, if the appendix happens to be out near the anterior superior spine, make a near midline or a right rectus incision and drag an inflamed and perhaps perforated appendix across an otherwise clean part of the peritoneal cavity? Or if it happens to be near the midline, why make a split muscle incision? Or, in the case of an undescended cæcum with a retrocæcal appendix, why approach it with the so-called McBurney's point as an objective rather than the appendix itself? If you try this you will be surprised to find how difficult it will be to get into an operation rut—and what is worse than a surgical rut?

The principal surgical conditions giving rise to the acute abdomen that occur to one's mind are:

Acute appendicitis.
Peritonitis from ruptured pyosalpinx.
Acute obstruction.

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Acute obstruction supervening upon a chronic condition.
Intussusception.
Acute cholecystitis.
Perforated duodenal and gastric ulcers.
Perforation in typhoid.
Acute pancreatitis.
Ruptured ectopic pregnancy.
Ovarian cyst with a twisted pedicle.

I am purposely leaving out of the discussion traumas of the abdomen, as such would make a paper in itself, and we might be led to an acrimonious discussion of surgical trauma.

It is hardly necessary to take up time with a discussion on the diagnosis of *acute appendicitis,* and yet a few weeks ago a man struggled to my consulting room complaining of pain beginning in the left loin and radiating down to the left inguinal region, with pain in the left testis associated with frequency of micturition, upon whom his family physician and a so-called surgeon desired to operate for acute appendicitis!

Peritonitis from ruptured pyosalpinx begins with a gradually increasing pain referred to the umbilicus, with marked tenderness and rigidity in the lower abdomen. There is a history of some previous attack associated with a vaginal discharge; often a delayed convalescence from pregnancy or following a miscarriage. A bimanual examination reveals a mass in one or both broad ligaments. There is a greatly increased leucocyte count—I have seen it as high as 48,000. Upon several occasions when I have been called to operate upon an acute appendicitis, and have had no opportunity to make a careful preliminary examination because of an apparent need for haste, I have as a result of a careful preliminary palpation under the anæsthetic been led to make a near midline incision and thus have been saved the necessity of *explaining* why it was necessary to make two incisions "to save the patient's life!"

Acute obstruction frequently mainfests itself first of all by nausea, and later with vomiting, with more or less pain and this usually paroxysmal in character. The patient is sure he has colic. An enema is given for relief and neither gas nor fæces follow the administration, while the vomiting becomes more frequent and early gives an offensive odour. One may be morally certain of an acute obstruction from some cause. If one can detect visible peristalsis, it is additional convincing proof of the condition. In such cases of acute obstruction—when one cannot resort to the use of the *x*-ray without hazarding the patient's life—one may frequently get an accurate clue to the site of obstruction by a careful palpation of the abdomen under anæsthesia, not necessarily by feeling the obstruction, but by being able accurately to outline a coil of especially tense bowel just above the obstructing point. This is particularly true in internal hernia,[1] where a loop of bowl has passed through a narrow opening.

In *acute obstruction supervening upon a chronic condition*, one has a history of a gradually increasing constipation. The symptoms of acute obstruction occur, but the patient, having developed a certain amount of tolerance to the toxæmia, takes longer to become critically ill, hence an opaque meal followed by an *x*-ray examination may assist one in arriving accurately at a diagnosis. Palpation under an anæsthetic will sometimes lead one to the obstructing induration, if one has failed to locate it previously.

Intussusception[2] usually occurs in an infant or young child. It is ushered in with a sudden cry, followed by vomiting. Then attacks of paroxysmal pain supervene. An enema brings away no gas or fæces except from the lower bowel, but there is sooner or later straining with bloody mucous in the stool. As a rule the abdomen remains flaccid except during a paroxysm, and one may readily outline a sausage shaped swelling within the abdomen, usually upon the right side.

In *acute cholecystitis* there is frequently so much rigidity in the upper abdomen that, while one may be morally certain of the diagnosis, yet he is permitted a sigh of relief when he palpates the abdomen under anæsthesia and makes out readily the fundus of the gall bladder, and is able to differentiate the liver margin. On two occasions I have been called hurriedly to operate upon an acute gall bladder. The pain was under the right costal arch, there was tenderness and rigidity in the upper right rectus. When the patient was under the anæsthetic one could feel some distended tense coils of intestine, but no enlargement suggesting a distended gall bladder. This led to a careful reëxamination of the inguinal canals. On the right side one could feel a small kernel-like lump which had not been observed in the previous examination. I opened the inguinal canal and found a strangulated hernia, the relief of which gave complete relief to the patient's symptoms and saved a futile operation upon an innocent gall bladder.

Perforated duodenal and gastric ulcers seldom give rise to much difficulty in the diagnosis. There is a history of "indigestion" with acidity; hunger pain coming on two or more hours after meals, relieved by eating. Then comes the sudden pain accompanied by shock and sweating. I remember, however, that on one occasion I made a hurried call to the country to see a case with such a history. The pain was referred to the left costal margin, and there was rigidity in the upper left rectus with evidence of fluid in the flanks. I did not observe in the candle light of the bedroom that there was marked pallor. When, however, she was brought to the improvised operating table where we had a very good light from several lamps, I did, and in consequence made a pelvic examination, and found a mass in the left broad ligament, opened in the lower abdomen instead of the upper, and cleared up a ruptured ectopic pregnancy. It is well therefore to keep such a possibility in mind. In perforated ulcer the recognition of free fluid in the flanks is a helpful sign and may be elicited by placing one hand in the flank and gently percussing or flicking the abdomen as described by Professor McPhedran[3] several years ago.

In the last five cases of perforated duodenal ulcer a palpation under anæsthesia has led me to continue my incision downward so that I might the more readily explore the appendix, and in all five of these cases I have found *an acutely inflamed appendix associated with a kink of the lower ileum.* In one instance the appendix was on the point of perforating. The appendix in each case was removed and the ileal kink divided, and then the duodenal perforation which had been carefully packed off was dealt with. The recovery in these cases was so rapid, as to be spectacular. I am inclined to think that some former cases suffered more, and had a more prolonged and eventful convalescence because of an associated appendicitis. One cannot help wondering if there is any relationship between cause and effect.

While on the subject of perforated duodenal ulcer, I must relate a peculiar incident that occurred several years ago. On three successive days I had three cases of perforated duodenal ulcer sent into the hospital by the same physician. When he 'phoned me, I asked "What is the matter?", and he replied, "I don't know, but he is very ill—see him as soon as you can." This surely is a much greater appreciation of one's duty to his patient than that of the family physician and a consulting physician, who took ten days to make a diagnosis of intestinal obstruction, and then growled at the inefficiency of the surgeon who was called in to perform—not an operation—but a miracle!

Perforation of the bowel in typhoid frequently presents great difficulty in diagnosis. The patient is already so ill that his sensibilities are dulled and he may not react readily to altered conditions. If I were asked to mention the one most constant sign of perforation, I think I should pin my faith to a diminution or complete absence of liver dulness. There may be pain at first but this is quickly relieved by nature pouring out serum and lymph. Then there is shock, and a gradual increase in the fixation of the abdomen with costal breathing. At first, a sudden drop in the temperature with an increase in the pulse rate, just as in hæmorrhage, may call one's attention to some alteration in the patient's condition and thus put one on his guard.

I have operated upon seven cases of perforation of the bowel in typhoid fever with six recoveries! The case that died succumbed from double pneumonia six days after the operation. At autopsy the perforations were found closed and the peritoneum clear. You say I must have got the cases early. If I did it was my fault for I did not wait for ante-mortem signs of an impending autopsy, such as one finds described in text-books dealing with the subject. One must realize that these patients before perforation are already desperately ill from the disease. In dealing with them surgically, no time must be lost in deciding when to operate, nor must any time be wasted during the operation, nor must the bowels be mauled about, looking for perforations! *The coil of bowel that perforates is already much thickened* from the ulcerative process, and when the abdomen is relaxed under the anæsthetic this thickened coil can readily be felt through the abdominal wall. The patient's emaciated condition facilitates greatly in this observation. Then make the incision over that part of the abdomen, and the perforated coil will present at the opening. All that is required is a purse-string of chromic gut about the perforation or perforations. The coil is dropped back, drainage provided, and some silk worm gut closes the wound sufficiently. The entire procedure should occupy from five to twelve minutes. If these cases require evisceration, or if great handfuls of bowel require to be hauled out of the abdomen, far better would it be, both for the credit of surgery and for the sake of humanity, that the "perforated typhoid" be left to die peacefully under the beneficent influence of morphine than to be *mauled* to death on the operating table.

Acute pancreatitis presents many difficulties. The most characteristic symptoms are intense pain with marked evidence of shock, associated with an expression of fear upon the countenance. Even with the relief of pain there continues marked prostration. An examination of the stools for fat, and the urine for Cammidge's crystals may confirm a provisional diagnosis.

An overian cyst with a twisted pedicle, if the torsion is complete, is intensely painful, and the lump that usually can be felt above the pubes gradually increases in size unless the strangulation is relieved. One very suggestive thing that has frequently struck me about these cases is the great amount of sedative required to relieve the pain. While it may take away the sharp edge, the patient is still conscious of some discomfort. When the cyst is small, on the right side, and is still intrapelvic it may readily be mistaken for an acutely inflamed appendix. Here again palpation under anæsthesia will materially assist one in arriving at a more accurate decision and in directing the steps of the operation with less discomfort to the surgeon.

In closing, I wish once more to commend to you "palpation under anæsthesia". It will assist the intelligent surgeon and be helpful to the unsuspecting and sometimes the over-confident patient.

References:

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2. "Intussusception," F. N. G. STARR, *Canadian Practitioner and Review*, 1910.
3. "The Physical Signs of Exudate in the Peritoneal Cavity," A. MCPHEDRAN, CANADIAN MEDICAL ASSOCIATION JOURNAL, vol. i, 1911.

THE annual meeting of Alienists and Neurologists will be held Monday, July 9th, to Thursday, July 12th, 1917, in the Red Room, LaSalle Hotel, Chicago, under the auspices of the Chicago Medical Society. Dr. George A. Zeller will act as chairman. The programme will be mailed June 28th, with abstract of each paper, and contributions to the programme are solicited. There is no membership fee. The address of the Secretary is, Room 1218, No. 30 Michigan Avenue, Chicago.

NITROUS OXIDE-OXYGEN ANALGESIA AND ANÆSTHESIA IN OBSTETRICS

By Gordon G. Copeland, B.A., M.B.

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THE subject of this preliminary paper on nitrous oxide-oxygen analgesia and anæsthesia in obstetrics has more than an academic interest to our profession, in that these gases, properly used, conserve human life at its two most critical periods. My excuse for urging the use of a comparatively new and expensive method for the relief of pain in childbirth is found in its great safety, wide range of application, and life saving features. In the midst of this awful war, the conservation of infant life and adult female health is, I claim without fear of contradiction, of vital importance.

From the dawn of history, attempts have been made to mitigate the pains of labour. The necessity for relief in the majority of parturitions is urgent, especially among women in a high state of civilization as it exists to-day. The pain of labour is as real, and, unless relieved, its disastrous effects are as far reaching on the subsequent health of the mother, as pain of equal intensity from any other source. Among high-strung nervous women, in cities particularly, labour is frequently pathological. They are not sufficiently supplied by nature with those factors which enable women in savage states and of strong muscular development to deliver themselves without much trouble.

Lately, thanks to a widespread discussion in the press, the merits of various methods used to aid and relieve childbirth have been re-investigated. Much careful work has been done here in Toronto by Drs. McIlwraith, Watson, Kinnear, Gallie, Scott, myself, and others in the subject of morphine hyocine amnesia and analgesia. We have come to almost the same conclusions as other investigators, that in expert hands in selected cases under almost ideal surroundings, twilight sleep, especially in the first

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stages of labours which are long and painful, protects the mother from shock and exhaustion, relieves spasm, and does not apparently harm the baby. But we have also found that even if given correctly, this method frequently either fails adequately to protect the mother towards the end of the second stage, owing to the fact that the patient is not then under the influence of morphia, or if she is, the life of the baby is seriously imperilled. Coöperation on the part of the patient is almost absent and asepsis is difficult to control. The method is not suitable if the labour is likely to terminate within three hours. It fails partially or completely in about 20 per cent. of cases. To protect the woman fully it is generally necessary to give one of the inhalation anæsthetics at the perineal stage. In its proper place, morphine and hyocine analgesia is one of the most valuable agents we have, and I personally use it where indicated. My paper is not intended to decry the proper use of twilight sleep, but to present to you a method which is applicable to nearly all cases who can afford to pay for it.

Although one of the first inhalation anæsthetics to be discovered and its use suggested, nitrous oxide has not, until lately, come into the wide sphere of usefulness it deserves, owing to the difficulties connected with its purification, storage, and sale, and the lack of efficient machines to handle with ease and safety, gases under great pressures.

For a woman having a normal easy labour, and possessing intact liver and kidneys, needing only the keen edge taken off the perineal stage, all things being considered, I fail to see that we have anything much superior to chloroform or ether. I shall therefore exclude this fortunate class from my discussion.

Let me then discuss nitrous oxide-oxygen analgesia given with the use of a good machine. I have given these gases intermittently in the various stages of labour for periods up to five hours. Given correctly, they afford almost complete relief from pain, delay exhaustion, protect from shock, and do no appreciable damage to mother or babe in the first stage of labour. Coöperation on the part of the woman is as complete as her intelligence will allow. That is, the highest types of women get the greatest benefit by intelligently using the gases as directed. A rigid or spastic cervix is, however, but little relaxed under this method in comparison with that of the use of such drugs as morphia, hyoscine, ether, chloroform, ethyl chloride or chloral. If the first stage is likely to be long and painful, I think the patient is better off at first to be under the influence of morphia and hyoscine. As the pains increase in frequency and severity, however, gas and oxygen becomes the anæsthetic of choice. These gases do not stop contractions used in the following way, but permit the patient to bear down without pain or entire loss of conciousness. These gases are actually oxytoxic, but do not allow painful stimuli to reach the brain without greatly reducing their intensity. So much is this so that many women though conscious are unaware that a contraction has actually taken place. In marked and favourable distinction from twilight sleep, the patient is conscious between pains, can change her position, notify the nurse if she needs the bedpan, and is able to keep her hands from her genitalia. In suitable cases she may walk around the room between pains and aid in the engagement and moulding of the head by bringing into play the force of gravity, a valuable procedure in contracted pelvis. When her pain is about due she can recline on a couch, breathe in a few inhalations of nitrous oxide with sufficient oxygen to prevent cyanosis, and the contraction proceeds without her being aware of painful impressions. There is a tendency to amnesia. The patient does not fear the approach of the next pain for she knows that it will not hurt her. After the pain a few breaths of air, and she is herself again and may go around the room accompanied by the nurse. With certain types of machines, such as the Clark and McKesson, if desired, the patient may administer the gases to herself for much of the earlier stages of the labour. A mixture is determined by trial, to see what is the minimum amount of oxygen that will prevent cyanosis. When a pain comes on, the woman places the mask over her face, presses a button, breathes the gases, and is eased of her pain. There is little danger in this method if under the supervision of the obstetrician, for as soon as she is analgesic and before she is anæsthetic, she loses the power to press the button, which is then pressed up by a spring and the gases are cut off automatically.

When the head reaches the perineum in a primipara, or when delivery is about an hour away, the woman is put to bed, if not already there, and is draped with sterile coverings. A competent anæsthetist should now take charge of the anæsthetic. The woman is told to bear down, or breathe, as may be necessary. This she can do as the pain is absent or bearable. The pressure pain caused by compression of the sacral nerves is not entirely deadened by the gas and oxgen unless full surgical anæsthesia is given. The perineal nerves may now be surrounded by a local anæsthetic such as novocain or anocain thus following Crile's method of anoci-association, or as the head is distending the vulva a little ether may be added to the gases with great advantage, as the relaxation of the perineum is very much greater with the addition of the ether than with the gases alone.

If the delivery is operative, I like to have the patient under full surgical anæsthesia with the gases and sufficient ether to obtain adequate relaxation. In repair of the perineum, gas and oxygen is ideal, as pain is removed without relaxation of the uterus taking place, as occurs with chloroform and ether, leading to the attending danger of post-partum hæmorrhage.

The exact technique of administration of nitrous oxide and oxygen must be learned by experience. The percentages of gases vary with each patient. Cyanosis is the danger sign. Give sufficient oxygen to prevent duskiness of the lips, ears, or fingers. If the pains are snappy and at regular intervals, one of two procedures gives good results. As soon as the patient feels a pain coming, have her quickly and deeply inhale three or four breaths of pure nitrous oxide, then *at once* add oxygen or air or remove the mask for a breath lest the patient rapidly become asphyxiated. This is so easily avoided that nothing but carelessness will allow it to happen since the danger signs of cyanosis, rigidity or twitching, are so apparent. These three or four breaths of pure gas quickly get the patient under, and she can then be maintained in an analgesic state as long as necessary, with a gas-oxy or gas-air mixture. The alternative method, which I prefer, is to give the patient a mixture of about 95 per cent. nitrous oxide and 5 per cent. oxygen, or 90 per cent. gas and 10 per cent. oxgyen for several breaths before the pain starts. This time can often be estimated by timing or by holding the hand on the abdomen; the observer can detect the uterus hardening several seconds before the patient is aware of the contraction having commenced. Then when the contraction reaches a stage where it would have caused suffering the patient is already under the analgesia, and further administration of gases is easy. The nearer delivery approaches, the greater should be the percentage of oxygen, since the patient tends to become saturated with the gas, especially when it has been given over a long period, and hence she needs less of it and the baby needs more oxygen. After the patient has breathed in the gases in the manner outlined above, the machine should be turned on to rebreathing. This not only conserves gas, but also prevents the patient losing an excessive amount of carbon dioxide. As the pain is going off, stop the gases and remove the mask.

Of course continuous light analgesia may be administered in suitable cases by a skilled anæsthetist, but it is not so safe as the intermittent method, is more expensive, and generally less desirable.

There is a tendency for one to use too much gas and oxygen during the first few trials of this method and hence think it is more expensive than it subsequently proves to be when experience has been gained. In spite of the increased price of the gases, I can now in the average case give intermittent analgesia for slightly under two dollars per hour, when using a sight-feed-through-water type of machine such as the Safety Anæsthesia or the Gwathmey. The larger types of bag machines while not so economical nor portable are capable of finer and quicker variations.

Vomiting is rare with gas and oxygen if the patient is carefully prepared. When ether is added towards the end of the labour, slight vomiting is not uncommon, but is vastly less than would have occurred had straight ether been given, and rapidly passes off.

Nitrous oxide and oxygen analgesia I consider the safest of all analgesics in all hands, but I agree with Webster Davis, Edgar, Dickinson, and others, that pushed to full surgical anæsthesia it is the hardest anæsthetic to give, and unless in competent hands very dangerous.

With ether sequence or local anæsthesia at the proper stage supplementing when they are indicated, nitrous oxide and oxygen, properly given, have, in my opinion, no contraindications in the whole range of obstetrics. These gases produce the least pathological changes in the solid organs of any of the inhalation anæsthetics, and have the slightest tendency of all to produce acidosis, post-partum hæmorrhage, inertia, asphyxia neonatorum. Their after effects are evanescent and negligible.

I have employed these gases in several cases of grave cardiac decompensation, in preëclamptic toxæmias and in eclampsia where they are outstandingly the anæsthetic of choice. I have personally administered and had given for me these gases in cases with blood pressures ranging from 80 mm. of Hg. systolic to 260 mm. of Hg. systolic without appreciable change in the pressures except a fall in the highest attributable to loss of blood which was intentional. I have given the gases in cases of great irritation of the respiratory tract quite unsuitable for ether, and in kidney cases where chloroform would have done grave damage. In no case have I had any bad results attributable to the anæsthetic. The puerperium, is, I am strongly convinced, more normal than with any other anæsthetic.

In nitrous oxide and oxygen, however enthusiastic I may be over its beneficent effects, all that can be justly claimed for it is, that, properly administered, it does nearly all that an ideal anæsthetic would do. It should not be used as the chief reason for a high fee. Its use should not be a blind for dirty, careless, inefficient or meddlesome midwifery. It is not a panacea for all the troubles afflicting the parturient woman. It is a very valuable and life-saving factor in obstetrics, but most emphatically, not the most important. Good obstetrical skill and judgement, a clean surgical technique using asepsis and antisepsis in their proper places, will ever be the most vital factors ensuring safe childbirth. Of what use is it to prevent a woman suffering if she is to die in a few days of sepsis? I recommend Dr. C. H. Davis' recent book on this subject, which I had the pleasure of reviewing for the *Hospital World.*

There are several points in the administration of these gases that it has been my good fortune to discover, and so far as I am aware, with one exception these details are not in print, and are original:

(a) If the baby is blue, asphyxiated, shocked, or apnœic at birth, turn on full oxygen to the mother, turn the baby upside down, and clear the throat of mucus, liquor amnii, blood, etc. This life-saving procedure is best accomplished with a Carton's mucus extractor which is so successfully used in Dublin, or a moderate sized sterile catheter. If the baby's heart is beating, however feebly, and the placenta attached to the uterus, barring fatal injuries to the head, the baby will in all probability speedily revive. It is a marvellous and joyful sight to see a limp white baby turn pink in a few moments, and start to cry spontaneously. You know the fatiguing and discouraging alternative of tubbing, artificial respiration, spanking, etc., perhaps carried out for hours before the feeble spark of life will revive. I worked three hours and twenty minutes last winter over such a case before it would breathe itself. How easy it would have been, had I had oxygen immediately available at the crucial moment to flood the baby with the live-giving oxygen through the placenta.

(b) In all forceps cases, between periods of pulling, give the mother an excess of oxygen; this is regardless of the kind of anæsthetic and applies to chloroform and ether as well as gas and oxygen. Thus the baby will have an excess of oxygen in its brain to carry it over the period of compression when the cranial circulation has nearly ceased.

(c) In cases of placenta prævia, and abruptio placentæ partialis, of the latter condition arising in a special sense, from the former as soon as any separation and hæmorrhage takes place, oxygen is valuable; especially in a central placenta prævia where the cervix has been fully dilated by hydrostatic bags and the operator is ready to smash through the placenta and do a version and breech extraction, in the manner used at the Sloane Hospital, New York, which method gives the best fœtal results, is oxygen valuable just prior to this procedure. In breech cases and internal versions, ether should be added to get good relaxation when gas has been given.

(d) In breech immediately before attempting the extraction of the thorax and head, free the cord, saturate the baby with oxygen through the mother, and the vital three or four minutes may be very shortly prolonged with hope of a living child, that otherwise might be lost.

(e) In eclampsia not only is nitrous oxide the least damaging, but oxygen being deficient any way, is specially necessary.

(f) In abdominal Cæsarean section, just before opening the uterus, flood the mother with oxygen even if giving ether, and the baby will likely survive, if viable. This simple addition may be the vital factor.

(g) In any labour, should the child's life become endangered, as proven by tumultuous movements, failing fœtal heart sounds, eclampsia, long pressure, etc., give the mother oxygen freely, regardless of the kind of anæsthetic used. This measure will frequently be life-saving.

I have used nitrous oxide and oxygen in all stages of labours, normal and pathological, chiefly the latter, in operative procedures such as forceps, version, Cæsarean sections, abdominal and vaginal, with such conditions present as contracted pelvis, breech, placenta prævia, eclampsia, hæmophilia, etc., in some forty cases over a period of more than two years, and involving over sixty administrations. I find this method is by far the safest we have and my opinions are largely shared by my anæsthetists, especially Drs. T. A. Robinson and T. R. Hanley, who have helped me in many of my private cases, and to whose coöperation and enthusiasm I owe much.

If, as one of the pioneers in the use of this anæsthetic in obstetrics, I have added a few facts of value to others in their efforts to make labour bearable as well as safe, and if I have helped to stimulate an interest in this subject which seems destined to a great future, and have added my quota towards preserving human life and making motherhood healthier and happier, I have removed but a drop from the ocean-debt of love we all owe our mothers.

AN ANALYSIS OF THREE THOUSAND CASES OF OBSTETRICS

By S. P. Ford, M.D.

Norwood, Ontario

THE subject I have chosen for the foundation of my talk this evening, for I could not call it either a lecture or an address, is one intimately connected with that mystery of mysteries, the problem of human life. Whether we accept the evolutionary theory of Darwin as to the origin of human life, or fall back upon the literal interpretation of the Scripture narrative, it comes to the same thing in the end, namely, "the Lord God formed man of the dust of the ground and breathed into his nostrils the breath of life and man became a living soul." And in the never-ceasing reproduction through all the successive ages of the world's history, in all parts of the earth, among all the divergent races, by the selfsame process of this complex being, formed of the dust of the earth and the breath of God, lies the greatest miracle of all miracles. Many men are found to-day who solemnly affirm that they do not believe in miracles, but they do nevertheless for they believe in themselves. Let these doubters consider for a few moments the apparently simple, but marvellously complex, process by which the result is wrought out, the coming together of the sexes, the passage from the male to the female of one or two centimetres of a white, glairy fluid, and from this small beginning, by some mysterious process of constructive evolution, unseen by mortal eye, the building up of this human mechanism with its wonderful combination of muscles, arteries, veins, capillaries, nerves, and lymphatics, the elaborate provision made by the formation of richly endowed special organs for the introduction, digestion, and assimilation of food, and for the regular elimination of the various forms of waste matter, and the whole work culminating, at the termination of a stated period of two hundred and eighty days, in the issuing into the world of that crowning glory of the Almighty's

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handiwork, a perfect child, who will dare to say that this is not the greatest miracle of all the ages? In the volume of the Sacred Law, in that book compiled by the wisest of men it is written, "Keep thy heart with all diligence for out of it are the issues of life." After mature consideration of the part they play in this great work may we not as appropriately say, study diligently, treat respectfully, handle carefully the female generative organs for out of them are the issues of life? I read some time ago in a medical journal, a statement made in an address by one of those self-constituted champions of woman's rights, to the effect that had she been entrusted with the duty of providing a scheme for the propagation of the human race, she would have devised some less obscene method than that in use by the lower animals. My conclusion at the time was that she was a spinster past middle age, who had never felt the magnetism of the sexual embrace, nor the heavenly thrill of happy motherhood. Certain it is that she had not the faintest conception of the dignity of the divinely appointed process that she so rudely despised. And I heard a physician say sometime ago that he would rather clean out a garbage can than attend a confinement, for he could use a shovel in the former case but would have to soil his hands in the latter. Poor fellow, he too had no conception of the honour conferred upon him in permitting him to act as a co-worker with the Almighty in this most honourable of all occupations, and should have been engaged by some municipal corporation to do the work he so greatly preferred. In all sincerity, I can say to you to-night that from the first time I entered a lying-in-room more than fifty years ago as an *accoucheur* down to the last time only a night ago, an undertaking repeated over three thousand times, I always did so with a profound sense of the responsibility resting upon me, as well as the great honour conferred. And feeling thus about the matter, no amount of money was ever for a single moment considered sufficient to induce me to interrupt the completion of a pregnancy, and in those cases when it was considerd necessary to do so in order to preserve life, as in the case of pernicious vomiting or puerperal eclampsia, it was always undertaken very reluctantly and only after consultation with a brother practitioner and never undertaken in the case of an illegitimate, except under the same distressing circumstances. My introduction to this branch of the profession was somewhat disheartening. My first case, which came to me a few days after commencing private practice, was a monstrosity of that peculiar type in which the whole superior part of the calvarium was wanting, and in making the preliminary examination my finger struck the brain substance, and for some anxious moments I did not know just where I was. My second case was one of twins at seven months, in a primipara, aged eighteen, both breech presentations. My third case was still worse, an arm and shoulder presentation, also in a young and somewhat hysterical primipara, necessitating podalic version. My fourth was a case of rigid os uteri, which for twenty-four hours resisted all efforts at dilatation, and I was not then familiar with the more modern methods of overcoming the difficulty. My next was one of, what I thought then, a frightful case of post-partem hæmorrhage, and I can assure you that my courage oozed from my finger tips as rapidly as the blood flowed from the patient. Small wonder was it that I began to think I had made a great mistake in entering the medical profession, and laid awake at nights dreading to hear the door bell ring, lest it should be a call to another nerve-racking case of confinement. But time, the great healer of all things, finally came to my relief; my next ten or twelve cases were all on Easy Street, so that I regained my courage, and was not seriously alarmed again until I met my first case of placenta prævia several years later.

Comparing the figures in my note book with those found in the large volumes on obstetrics, I find they approximate so closely that I need not spend time in enumeration. Of the three thousand cases attended in the fifty years, 1574 of the infants were males, 1424 were females, and two were hermaphrodites. The number of first confinements was 1542, and much the larger proportion of these occurred during the first twenty-five years of my practice, accounted for by the fact that since the opening up of our great North-West, and the building of the Canadian Pacific Railway, large numbers of our young men have listened to the exhortation "Go West, young man," and have emigrated toward the setting sun. The number of second confinements was 715; third, 275; fourth, 125; fifth, 74; sixth, 70; seventh, 47; eighth, 42; ninth, 38; tenth, 32; eleventh, 20; twelfth, 8; thirteenth, 5; fourteenth, 3; fifteenth 2; sixteenth, 1. My youngest subject was a little Home girl who became pregnant at the early age of twelve years and nine months, and was delivered of a healthy, well-formed male child at the age of thirteen years and six months; my oldest subject lacked only two months of completing her fiftieth year, and in both these cases, strange to say, the labours were comparatively easy. I note forty cases over forty-six years of age, and twenty-five under fifteen years of age, one case in which pregnancy did not take place until eighteen years of marriage, although husband and wife were both apparently in perfect health, devoted to each other, fond of children, and cohabited during the whole period; and three cases in which fourteen, sixteen, and seventeen years, respectively, intervened between the first and second pregnancies. I had thirty-six cases of plural births; in five cases both children were males, and in six cases both were females, and the remaining nineteen male and female. In seven cases there was a breech presentation of both infants, the remainder were head and breech, nineteen cases, and head and feet four cases. In twenty-four of the cases one placenta served for both infants, in the remaining six there was a placenta for each; I note six cases of unmistakable placental disease, resulting in every case in the death of the child, either before or very shortly after birth. I narrowly escaped having a case of triplets, but the family removed from town a few weeks before the confinement, which I was engaged to attend, was due. I have attended nearly one hundred cases of illegitimate births, a large proportion of them during the first twenty years of my practice, easily accounted for by the greatly improved moral and social conditions prevailing in the community during the last twenty-five or thirty years. Many of these cases occurred in the poor and sparsely settled country to the north and north east of Norwood, where in those days many of the dwellings were mere shacks, with no nearby schools and only very occasional religious services. I went one Sabbath day, many years ago, into a settlement in a remote part of the township of Methuen, made up of about a dozen families, to see a poor woman suffering from puerperal fever, and they told me that they had not had a religious service of any kind in that settlement for ten years; after attending to the patient I proceeded to hold one forthwith. A great improvement has taken place since then. Now they have a day school, a Sunday School, and regular Sabbath services. I was called to another case in the township of Lake, forty miles north east of Norwood, where the woman had been in labour for fifty-six hours. They were six miles from any neighbour, and it was six miles farther on to the next neighbour; they had no school, no church, no post office, no reading matter of any kind, and the husband told me they had been living there for twenty-eight years.

I will now deal with the cases in groups, beginning with that dread of all rural practitioners, on account of the difficulty of getting prompt professional assistance. Almost needless to say that I refer to cases of placenta prævia.

Placenta Previa. I have been called to six cases of this class, three in my own practice and three in consultation. Three of them were cases of central implantation, and three of lateral or partial implantation. The lateral, as compared with the cases of central implantation of the placenta, were more easily disposed of. If the os was not sufficiently dilated to allow the introduction of the hand, I tamponed the vagina as tightly as possible with antiseptic gauze and waited. As soon as sufficient dilation had taken place, I introduced my hand, grasped the feet and completed a podalic version as rapidly as possible. As marginal attachment of the placenta does not, as a rule, give rise to special symptoms before gestation has advanced to seven months or over, it may be possible sometimes to save the child. But in cases of central or vicious implantation, symptoms occur at an earlier period, and as soon as the diagnosis is definitely established there is but one thing to do and that is to empty the uterus as speedily as possible without temporizing with either tampon or ergot or anything else. In two of these cases, I was able to pass my hand between the rim of the placenta and the uterine wall and do a version. Both mothers recovered but the infants had been dead for some time. In the third case, a young primipara recently from England, there was no hæmorrhage until the eighth month. It came on, however, very rapidly, and as I was unable to pass my hand around the edge of the placenta, and the urgency being extremely great, I pursued the heroic course of pushing my hand, amid terrific hæmorrhage, right through the centre of the placenta, fortunately avoiding the insertion of the cord, and grasping the feet I succeeded in turning and delivering both infant and placenta together in a few minutes. The result was very gratifying to me, namely, a living mother and a living child. That was ten years ago, and I am glad to say I have never had another such case since.

Equally dreaded by the rural practitioner are those cases of

Puerperal Eclampsia. I have had twenty cases; in fifteen the seizures began before delivery, and in twelve of these the seizures ceased at delivery; in five cases the seizures did not come on until after delivery. Five of the twenty cases proved fatal, and in all of these five cases the eclamptic seizures came on before delivery, leading me to the conclusion that the post-partem cases are not to be so much dreaded as the ante-partem ones. As to treatment in asthenic cases with full, bounding pulse, high temperature, purple countenance, I would not hesitate a moment about opening a vein and abstracting twenty-five or thirty ounces of blood. I have done this in several cases with the very best results. But in an asthenic case with feeble pulse, pale countenance and cold extremities, I certainly would not pursue that course; I saw it done once under such circumstances with a fatal result. Is it proper, in all cases where convulsions occur before delivery, to proceed at once to empty the uterus? My answer is no, not in all cases. If labour has already set in, and there is nothing to contraindicate it, I would expedite it by all means, even by an *accouchement forcé*. But if labour has not already begun, I would wait, using every possible effort to control the seizures, until nature showed symptoms of commencing her work, and then assist her in every way. My experience has been that we only add to the trouble by endeavouring to excite a quiescent uterus to expel its contents. Many cases of threatened convulsions were warded off by appropriate eliminative treatment. One case I recall where the urine showed 50 per cent. of albumin for several days.

Face Presentations make up another troublesome class of cases, for unless the head should be unusually small or the pelvis unusually large, it is impossible for the child to be born in this position. If called early the condition may sometimes be rectified by manual interference. Fortunately face presentations are comparatively rare. In only three of the eight cases that came under my care was I able to rectify the position, either by external manipulation or with the assistance of the forceps, and had to resort to podalic version.

Arm and Shoulder Presentations. I have had only ten cases of this very troublesome complication. In three of the cases, in which I was called early and recognized the difficulty before the rupture of the membranes, I was able to change the presentation by external manipulation, and where this expedient failed I resorted to podalic version. The infant mortality in these cases was one in ten.

Prolapse of the Cord. I had six of such cases and succeeded in saving the child in each case, either by holding the cord out of danger by my hand, or by fastening it to a gum elastic catheter and pushing it up out of harm's way until the descending head filled the pelvic outlet.

Occipito-Posterior Presentations. These have been comparatively rare in my practice, numbering only twelve, and as a rule have been very tedious cases. In a few of them I was able to change the condition by careful and persistent manipulation. In two cases I had to do a version, and in two others where the head was small and the pelvis roomy I delivered with forceps. In the case of a young and somewhat petite primipara, I had a laceration of the perineum extending through the external sphincter.

Uterine Hydatids. My note book shows four cases of that curious and interesting phenomenon; in two cases representing one member of a twin pregnancy, and two forming a single shapeless mass of unorganized tissue, the so-called hydatiform mole.

Sudden Death. Not long ago I was expressing to a brother physician my gratification that during my long practice of over fifty years, I had never met one of those cases of terribly sudden death during confinement. But it came to me only a few days later. The patient was a young Englishwoman, twenty-four years of age, about a year married, living with her husband on a farm. She was apparently in the best of health, had had a normal pregnancy, was in ordinary labour a little over two hours. She got out of bed to urinate, the baby was born a few minutes after she returned to bed, and I was in the act of removing the placenta when she gave a gasp, and in few moments was dead.

Inversion of the Uterus. I record one case of complete inversion of the uterus, with the placenta still adherent to the fundus. It was caused by traction on the cord by the midwife before my arrival. The books say that reposition may be easy or extremely difficult, depending on whether the uterine musculature was lax or tightly contracted, especially the circular fibres at the lower zone. In this case, strange to say, there was very little hæmorrhage, notwithstanding the laxity of the muscular fibre, and after peeling off the adherent placenta I had not very much difficulty in returning first one horn and then the other, and finally the body of the uterus. The patient made a good recovery.

Fancied Pregnancy. Have had six cases of this peculiar condition, one lady coming all the way from Manitoba, bringing with her a trunk full of baby clothes. She returned minus the baby, and had no use for the clothes until several years later.

Forceps Cases. I have resorted to the use of forceps in nearly two hundred cases, and would not feel safe to go to a case any distance from home without them, but as a matter of fact I have only used them twice in the last eighteen months. This I attribute to the use of pituitary extract. I was very sceptical about the benefit to be derived from it for some time, and hesitated to use it, but now I never go to a case without it. When I began its use I gave the full centimetre dose, but in one or two cases it brought on such violent expulsive efforts that I was alarmed for the safety of the uterine wall, and put the patient under an anæsthetic to relieve the strain. I avoid this now by giving only a half-centimetre dose at first and repeating it in twenty minutes or a half hour, if necessary; but in few cases will it be found necessary to repeat the dose. In these doses I have not found it to have injurious effect upon the infant; I have found pituitary extract especially useful in abortion cases at three or four months when difficulty is often found in emptying the uterus of the small placenta or portions of membranes. In most of such cases I have found it act like a charm.

In concluding this paper, let me say that I owe a great deal of my success in this branch of the profession to the instruction and counsel of my preceptor, the late Dr. George Burnham of Peterboro', and to the advice I received, when beginning my practice, from the late Dr. Hodder of Toronto. Learn, said he, to distinguish between promptness and hurry; always be prompt, never be in a hurry. And, furthermore, make it a rule never to leave the lying-in room until one hour after the last stage of the confinement is happily terminated. Better to miss a dozen calls than to lose one patient. By the strict observance of this rule I have saved life in several instances.

The annual meeting of the Canadian Public Health Association and the Canadian Association for the Prevention of Tuberculosis will take place in Ottawa during the fourth week in September of this year. The Canadian Conference of Public Welfare, including the Ontario Children's Aid Society, the Association for the Care of the Feeble-minded, and the Canadian Conference of Charities and Corrections, will also meet in Ottawa during the same week.

HELIOTHERAPY IN ABDOMINAL TUBERCULOSIS

By J. H. Elliott, M.B.

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THE value of heliotherapy in the treatment of certain forms of so-called surgical tuberculosis has been definitely established. Especially satisfactory results have been reported in tuberculous disease of bones and joints, both in closed cases and those with discharging fistulæ. In the latter there is frequently involvement of the skin as well at the opening of the fistulous track. Contributions on this subject have been presented to this association by Brannan and Hinsdale. Gardiner last year related some experiences with sunlight in the treatment of pulmonary tuberculosis. Other fellows, Klebs, Pottenger, Pryor, and Twitchell have recorded their views elsewhere, principally dealing with infections of bones and joints or with pulmonary disease. With the exception of Pryor's work, the cases have been treated under conditions involving rest in places which have recognized value as health-resorts—the Swiss Mountains, Colorado, California, or the seaside as recorded by Brannan in his story of the work at Seabreeze.

Pryor has demonstrated the possibility of securing good results at an inland point which boasts of no altitude, and I think I am correct in saying the hours of sunshine are less than those clouded.

My earlier experience with heliotherapy was in Muskoka several years ago when a group of men with pulmonary tuberculosis would take a row boat and each day the weather would permit them, would spend several hours in the sun on a nearby island. Most agreed that they were deriving benefit from their treatment, but I could not satisfy myself that their improvement could be ascribed wholly or even principally to the sun exposure. One of

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my patients has written, "The psychological effect upon the patient as treatment progresses is worthy of note. There is a certain feeling of well-being when basking in the sun, pleasant dreams are dreamt, and visions of happier days to come, flit before the mind." This group of men did well but no doubt the mental effect was as important and probably more important than the physical. They got away from their verandas and petty veranda gossip; they could see no painted walls from where they basked in the sun, but only great rocks of gneiss and granite clothed here and there with the foliage of the wilderness.

The treatment of abdominal tuberculosis to which I wish to refer, has been carried out within the confines of a large city with no particular climatic advantages outside the long days of midsummer with many hours of sunshine, or the bracing effect of keen bright winter days which are uncertain as to the month of their appearance as well as to their duration. In fact, we may scarcely lay claim to the possession of climate but have instead, what our good friend and past president, W. F. R. Phillips, would doubtless prefer to describe as weather.

Toronto is a city of 500,000 people, situated on the north shore of Lake Ontario. The mean temperature for a series of years is 44·4 degrees; total precipitation 34 inches, six and one-half of which is represented by the mean snowfall of 65 inches; relative humity is 77. The yearly average of hours of sunshine is 2,048 or 5·61 daily, which is 46 per cent. of possible. Even with this percentage of sunshine, exceedingly good results may be obtained.

I have had experience with three types of abdominal tuberculosis, which have responded to heliotherapy.

1. Tuberculous enteritis.
2. Tuberculosis of the ileocæcal and appendix region.
3. Tuberculous peritonitis with ascites.

1. *Tuberculous enteritis.* Illustrative case, N. W. Single, aged nineteen.

In May, 1913, had "a slight cold which persisted". There also was debility. The site of her pulmonary lesion was at first difficult to place, yet the diagnosis was clear and tubercle bacilli were present in the sputum. The summer was spent in Muskoka under careful medical supervision with but little apparent benefit. After her return to Toronto in the autumn, improvement set in and in a few weeks cough and sputum ceased entirely. The pulse rate remained elevated and strength did not return, nor could we secure any marked gain in weight, and appetite remained poor. This condition continued throughout the winter and early spring, making one feel that at any time a fresh outbreak of her disease might be expected. Later a cough with fever developed with very definite physical signs in the left upper lobe and in the month of May, 1914, a troublesome diarrhœa set in. This continued throughout the summer, and for over three months the temperature chart resembled that of typhoid. The usual remedies were tried without marked benefit and the patient became quite emaciated. The cough continued and tubercle bacilli were abundant in the sputum.

Towards the end of the summer of 1914 heliotherapy was begun and improvement soon set in. The diarrhœa gradually lessened as the temperature began to fall, appetite, which had been practically absent for a year, began to return and in a short time it was evident that the patient was gaining in weight. The retraction and dough-like feel of the abdomen soon lessened. The sun exposures were begun in the patient's bedroom which had a southern exposure, as no protected sunny porch was available. Strength gradually returned and the typhoid-like weakness and emaciation notably lessened. A little later she was moved into a tent in the garden, from which longer daily exposures were possible. With the improvement in the abdominal signs and symptoms, there was noted a decrease in cough and expectoration, with a corresponding lessening in the physical signs of active disease in the left upper lobe.

By October she was able to visit my office. Her weight now was 137½ pounds, her last previous weight in April was 90 pounds. During her enteritis, she must have fallen to 75 or 80 pounds, perhaps lower.

The cough and sputum gradually ceased. In December, she went to Ashville for the winter, but weather conditions were not found to be better than at home. She soon undertook exercise; strength returned and on her return to Toronto, weighed 127 pounds, no cough, was walking fifteen minutes daily, pulse 60 at rest, 72 after exercise, examination of abdomen, negative.

By June, 1915, she was walking forty-five minutes daily and stated that she never felt better in her life.

At present she is able to take full exercise, pulse and temperature normal; physical signs in the left apex those of a healed tuberculosis.

2. *Tuberculosis of ileocæcal and appendix region.* Illustrative case, P. W.

First sign of tuberculosis in July, 1912. Severe pulmonary hæmorrhage followed by a period of fever. Seen by me in September of same year, showing extensive physical signs of consolidation in left upper lobe from second to fifth rib in front, and both posterior apices and most of scapular region, pulse 110 to 120 at rest, sputum at first rather less than one ounce, gradually lessened but showed bacilli for two years. Physical signs posteriorly gradually cleared but those of consolidation and excavation persisted to left of the area of cardiac dullness.

During the winter of 1914–1915 he complained of abdominal pain soon after beginning a meal, at first only at lunch, but later at dinner as well, The pain was across the abdomen at or below navel. When eating in bed and using hot water bottle, the pain would be less or absent. It would often last one to two hours. Examination February, 1914, showed lower border of stomach at about level of umbilicus. Splashing present one hour after breakfast. Slight rigidity over right iliac fossa, tenderness at McBurney's point and below, palpable thickening in this area, pain on deep pressure radiating up toward stomach. Seen by Dr. Parfitt in consultation and by a surgeon who agreed with diagnosis, operation seemed advisable because of slight evening fever, 99° to 99 2-5°, and because of interference with nutrition. The consulting surgeon did not wish to undertake an operation fearing the result would not be satisfactory. Sputum at this time increased appearing through the day as well as in the morning as formerly.

With operation refused by the surgeon, heliotherapy was instituted in May, 1914. He had been on rest cure on an open porch for a year and a half, day and night, summer and winter, pulse rarely below 110 during the whole time, slight daily rise of temperature, appetite had become very poor and because of the severe abdominal pain it was impossible for him to take the nourishment he needed.

At the end of three months he was able to expose himself for three hours each morning and two hours each afternoon. The abdominal trouble gradually disappeared and an operation was no longer considered necessary. At the end of four months he had gained thirty pounds in weight, the cough had disappeared, sputum became very slight and was mucoid, and tubercle bacilli were no longer to be found. During the winter months he exposed himself but little. Last spring the exposures were again undertaken, sputum ceased and his physical signs and symptoms are now those of healed pulmonary tuberculosis, with all abdominal signs and symptoms absent.

3. *Tuberculous peritonitis with effusion.* Case F. W. Rather acute onset simulating typhoid fever.

In second week with Widal negative and signs of effusion diagnosis of tuberculous peritonitis was made. The effusion increased until abdomen became much distended and he was admitted to St. Michael's Hospital. Temperature was persistently high for many weeks and there was no definite improvement until heliotherapy was instituted. The temperature then gradually fell. Throughout the winter of 1914–1915 his bed was kept alongside a window with south aspect, and the sun was far enough in the south to allow exposure from about 9 to 1 each day. On mild days the window was completely raised. His body became well browned and as this increased, the fluid decreased. In February he developed a pleural friction rub on the side exposed to the draft from the open window, but no effusion was at any time demonstrated. Before the warmer weather of spring arrived, he had overcome completely the evidence of toxæmia, all signs of fluid were absent and the friction was no longer present.

He was soon able to leave the hospital and has had no return of symptoms.

Method. The patients treated out of doors used the Adirondack recliner or similar chairs; those treated indoors in winter, a hospital bed of proper height. Treatment was begun with exposure of the feet to the direct sun for ten minute periods twice during the day, once in the morning and once after the rest hour in the afternoon. On the following day the abdomen was similarly exposed, increasing the exposure of the arms and legs by ten minutes each day, that is by five minutes morning and afternoon. By this method a progressive pigmentation of the skin was secured. One patient noted that on a cool, clear day the sun burns more intensely than on a hot, humid one, and with less warning of discomfort, so that if care be not observed painful blisters would result. Cloudy days interfered with the treatment but benefit was no doubt derived from simply exposing the body to the air. Screens may be arranged about the patient to ensure privacy and to break the force of unpleasant winds. When the sun is hot the head is to be shielded from the direct rays of the sun and smoked glasses are used to protect the eyes. One patient found that a sponging with an alcohol rub taken after exposure increased the feeling of well-being and would lower the pulse rate if increased.

Patients must be warned against the dangers of insolation, symptoms of which may appear and prove unpleasant if not dangerous, if too rapid increase is made in the exposure periods.

SUMMARY

In abdominal tuberculosis, heliotherapy would seem to be a valuable addition to simple rest cure in the open air.

Good results can be secured at home and in hospital.

The method is applicable even in large cities which have no special climatic advantages, as demonstrated in a city with 46 per cent. possible sunshine.

THE question of enlarging the pathological laboratory of the Regina General Hospital was discussed at a recent meeting of the hospital board. Two members of he board considered it inexpedient to spend the required sum of money at this time, as, in their opinion, such matters should be left over until after the war. The importance of providing more adequate facilities for pathological work at the hospital was pointed out, however, and it was decided eventually that the necessary addition to the pathological department should be made and that the superintendent should be instructed to advertise the position of pathologist.

A SHORT DISCUSSION OF SOME PHASES OF GASTRIC AND DUODENAL ULCERS WITH REPORT OF CASES

By A. Moir, M.R.C.S., L.R.C.P.

HISTORY. While records of patients with hæmorrhage and perforation, undoubtedly due to ulceration, are found in medical literature as far back as the tenth century, it was not until Matthew Baillie, in 1793, described it anatomically that the disease possessed a definite place in medical thought. Cruveilheir was the first to discuss it from all sides about 1830. He was also the first to distinguish between cancer and ulcer of the stomach. Duodenal ulcer was first described by Abercrombie in 1824, but very little progress was made in our knowledge of these conditions until near the close of last century. Since that time these conditions have become much more thoroughly understood, largely due to the rapid strides taken in gastric surgery, and the information furnished by the opaque meal and the *x*-ray.

Until about the beginning of the present century, it was thought that gastric ulcer was of very much more frequent occurrence than duodenal, but more recent observations have proven, conclusively, that the reverse is true. Dr. W. J. Mayo, in a paper read before the Association of American Physicians in Washington, in 1915, made the following statement in regard to cases treated in the Mayo Clinic.

The relation of gastric to duodenal ulcer was as follows:

In 1904....	Gastric....73 per cent.	Duodenal....27 per cent.
In 1907....	Gastric....52 per cent.	Duodenal....27 per cent.
In 1910....	Gastric....35 per cent.	Duodenal....65 per cent.
In 1914....	Gastric....27 per cent.	Duodenal....73 per cent.

Moynihan, Robson, and in fact observers in the large clinics all over the world, have independently reached practically the same conclusions. It was at one time thought that ulcer occurred much more frequently in some localities than in others, that geographical situation had something to do with its causation. Even Osler in

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Read before the Peterborough Medical Society, February 8th, 1917.

his work published in 1908 gives considerable prominence to this view. One reason for thinking that some parts of the world are particularly prone to the development of ulcer, I think, lies in the fact that medical men in some localities are better able to recognize it than in others, and consequently see more of it, though it is quite possible that localities in which throat troubles are prevalent suffer more not only from ulcer of the stomach and duodenum, but from appendicitis and gall bladder troubles as well. Age and sex were also thought to have an important bearing on the occurrence of ulcer, and while they are probably more or less important, we know that both gastric and duodenal ulcer may occur at any age and in either sex. Several cases have been reported in medical literature, of definite ulceration occurring shortly after birth, and I had a case of perforated duodenal ulcer in a man over eighty years of age.

Ætiology. The various theories which have been advanced to explain the ætiology of ulcer of the stomach and duodenum are ingenious and interesting, but one after another these views are being abandoned, and it is becoming more and more evident, that many if not all cases of gastric and duodenal ulcer owe their origin to some infective process. The source of infection may not always be the same. It may come from the tonsils, the teeth, suppurating ears, nasal trouble, or from various other sources. There are many things that go to support this view, viz., the frequent association of ulcer with other infective processes, the frequency with which ulceration is associated with appendicitis and gall bladder disease, but above all the experimental work of Rosenow and many others. The work done by these men, and the light they have given us, furnishes the most interesting chapter in the study of these conditions. By their experimental work they have proven, not only that gastric and duodenal ulcer can be produced by the intravenous injection of certain organisms; but they have also proven the close relationship which exists between chronic appendicitis, gastric and duodenal ulcer, gall bladder and pancreatic disease. To show that by one and the same organism, differing only in virulence, all of these conditions may be produced, I cannot do better than quote Rosenow's own words, from a paper which he read before the Indiana State Medical Association, at Indianapolis, in 1915. He says:

> "I wish to call attention briefly to certain results following intravenous injection of streptococci which seem to throw some light on the mode of origin and pathogenesis

of appendicitis, ulcer of the stomach and cholecystitis. The accompanying table gives the incidence of lesions in the appendix, stomach and duodenum, gall bladder, pancreas and intestines in animals, following intravenous injection of streptococci from appendicitis, ulcer and cholecystitis, when first isolated, after cultivation on artificial media for some time, and after animal passage. It is seen that fourteen strains from appendicitis produced lesions in the appendix in 68 per cent. of sixty-eight rabbits injected, which is in marked contrast to an average of only 5 per cent. of lesions in the appendix in animals injected with strains isolated from sources other than appendicitis. Eighteen strains from ulcer of the stomach or duodenum produced hæmorrhage in 60 per cent., and ulcer of the stomach or duodenum in 60 per cent., a combined total of 74 per cent. of the 103 animals injected, in contrast to 20 per cent. hæmorrhages and 9 per cent. ulcers following the injection of other strains. Twelve strains from cholecystitis produced lesions of the gall bladder in 80 per cent. of the forty-one animals injected, in contrast to an average of only 11 per cent. of the other strains.

"From studies of the effect of animal passage on nonvirulent laboratory strains of streptococci, it was found that virulence appeared to be a factor in determining the place of survival of streptococci on intravenous injection. If the localization is related to virulence, then the incidence of the occurrence of ulcer and cholecystitis should become greater as the appendicitis strains are passed through animals, and appendicitis should occur oftener after the ulcer and cholecystitis strains loose their virulence by cultivation on artificial media. This is found actually to be the case. Thus the strains from appendicitis on isolation, produced ulcer of the stomach and duodenum, and lesions in the gall bladder in 1 per cent. of the animals, whereas after animal passage lesions occurred in 30 and 40 per cent. respectively."

Deaver of Philadelphia says: "Appendicitis is by far the most common intra abdominal disease. It is therefore the most common avenue by which infection may reach the abdominal circulation. Granting this is true, we have the keystone of the arch of intra abdominal diseases, which are always the result of infection. I believe the appendix is responsible for liberating the infection which in turn causes gastric as well as duodenal ulcer, and other forms of upper abdominal disease in an overwhelming number of cases."

This certainly throws a great deal of light on the ætiology of these conditions, and Rosenow's findings are quite in keeping with clinical experience. How frequently one sees attacks of appendicitis follow such acute infections as tonsillitis, influenza or typhoid fever. These attacks are entirely too frequent to be merely coincidences, and in the light of Rosenow's work I think we may easily see in them cause and effect.

Syphilis may also be a cause of gastric ulcer. In a report published by one of the German clinics in 1915 of 106 cases of syphilis with gastric disturbance, all of which gave a positive Wassermann, thirteen had definite evidence of ulceration. In none of these could a tumour be found and the röentgen picture gave none of the characteristics of callous ulcer so that gummatous ulceration could be excluded.

Symptoms. Both duodenal and gastric ulcer may occur without producing any symptoms. This has been proven beyond a doubt by autopsy findings. It is also proven by the fact that not infrequently perforation occurs without any history of previous gastric disturbance. As a rule, however, one is able to get a definite history of digestive disturbance which in the more chronic cases may have lasted for years. This disturbance may vary from a very slight indisposition, to that associated with severe hæmatemesis or such severe pain as to make life a burden. I have frequently noticed that the digestive disturbance in a given individual tends to follow a definite type. That is to say the symptoms occurring in different attacks resemble one another very closely and are often not influenced greatly by the character of the food taken. The symptoms of gastric ulcer tend to vary much more than those of the duodenal type. This is largely due to anatomical reasons, the area of the stomach being much greater than that of the duodenum, the location of the ulcer may be subject to greater variation, hence the greater variation in symptoms. Ulcers away from the pylorus tend to cause pain shortly after food, but those situated near the pylorus give symptoms often indistinguishable from those of duodenal ulcer. In these as in duodenal ulcer, pain comes on two or three hours after food, is often of a burning or gnawing character, and is often associated with gas and acid eructations, it is usually relieved by taking food or by alkalies. Some observers have laid great stress in duodenal ulcer, on the pain occurring in the night about two or three a.m. While very suggestive when present, there are many cases of duodenal ulcer in which it does not occur. Another important feature in the symptomatology of these conditions is found in the tendency there is for all symptoms to disappear for weeks or even months at a time, during which time the patient may feel perfectly well. The remission of symptoms in this way is a very important point in diagnosis. Vomiting may or may not be present in the early stages, but in the chronic cases with obstructive symptoms it is a very troublesome symptom. The stomach often secretes into its own cavity and patients will vomit quantities very much in excess of that taken in the way of food or drink. Hæmatemesis occurs in about 25 per cent. of cases and may be very slight or so severe as to cause death. First hæmorrhages, however, are rarely fatal.

Pain is a prominent symptom in most cases but its character may vary widely. In gastric ulcer there is a greater tendency for the pain to pass through to the back, and less tendency for it to be relieved by food. In duodenal ulcer there is a greater tendency for the pain to come on two or three hours after food, and to be relieved by food and alkalies. In duodenal ulcer the pain frequently remains localized although it may pass to the back and radiate to the shoulder as much as any case of gall bladder disease.

Diagnosis. It is very important that a careful history be taken in every case of digestive disturbance, for I think it is true without exception that when we get digestive disturbance occurring in a patient who is careful of his diet and habits of eating, and whose teeth are good there is some organic condition giving rise to the trouble, it may be a chronic appendix, gall bladder disease, ulcer or some mechanical interference with the action of the bowel from kinks, adhesions, etc. The physician is at least twenty-five years behind the times who would satisfy himself with a diagnosis of torpid liver in such a case. While we must admit that ulcers may exist without symptoms, generally speaking there is a more or less lengthy history of gastric disturbance in ulcer cases which tends to assume a definite type. The family history is not usually of much assistance, but there seems to be a tendency for the gastric type of ulcer to develop more frequently in young females, and the duodenal type in young males.

Physical Examination In gastric ulcer the point of tenderness is usually near the middle line, and the pain frequently passes through to the back. In duodenal ulcer on the other hand, it is usually to the right of the middle line and may occupy an area almost identical with that of the gall bladder. In such cases a valuable method of distinguishing between the two is to make firm pressure under the costal margin with the fingers while the patient is asked to take a long breath. In gall bladder disease the pain is increased by such procedure, while in the case of duodenal ulcer the pain diminishes as the tender duodenum slips out from under the hand.

The examination of the stomach by means of the opaque meal and *x*-ray is a very valuable means of distinguishing ulcerative conditions from others which furnish a similar set of symptoms. The technique of stomach examination by means of the *x*-ray has been so perfected in the last few years that it furnishes one of the most valuable means we possess in the diagnosis of these conditions. In the case of gastric ulcer we can sometimes see the crater of the ulcer filled with barium after the meal has passed from the stomach, and in duodenal ulcer the six hour retention, hyperperistalsis with cap deformity makes the diagnosis certain.

The chemical analysis of the stomach contents is not considered now to have the same value in diagnosis as it had some years ago. Hyperacidity is the rule but there are many other conditions in which it may occur, and it may be absent in ulcerative conditions. To quote Dr. W. J. Mayo: "The history is of first importance, x-ray examination second, physical examination third, and the purely laboratory findings a poor fourth. Of course in every case all these methods deserve consideration."

Differential Diagnosis. Cholecystitis or gall stones often produce symptoms identical with those of duodenal ulcer or gastric ulcer in the pyloric region. This is well illustrated by the following case:

Mrs. G., aged about fifty years. I saw this case in company with Dr. Neal. She had attacks of indigestion with gas and sourness over twenty years ago. Twelve years ago severe pain with vomiting followed with jaundice. Was ill at that time for six weeks. Was perfectly well then for periods of months at a time, but sick at intervals for a week or two at a time with vomiting and pain and jaundice in some of the attacks. Ten years ago she came to Canada, was very sick all the way, vomited and had very severe pain in the epigastrium passing through to the back and up to the right shoulder. She described the pain as cruel. For two years after coming to Canada she was perfectly well, then the attacks began again. Three years ago went back to the old country for a visit thinking that it would help her. Was ill the whole five months she was away and jaundiced the greater part of the time. Tenderness in this case was situated in the gall bladder area. We made a diagnosis of gall stones and advised operation. During the summer of 1915 she was perfectly well, but in October she had another attack of pain and vomiting, the pain radiating to the right shoulder; this time she was deeply jaundiced. She consented to operation and I sent her to the Nicholl's Hospital and operated, assisted by Drs. Neal and Mann. We made an incision through the right rectus, about an inch to the right of the middle line, and found a perfectly normal gall bladder, but in the duodenum about an inch from the pylorus was an ulcer which perforated at the time of operation. We stitched up the ulcer and did a posterior gastroenterostomy, she made an uneventful recovery and has enjoyed perfect health ever since.

I do not think you could get a case that would give a more typical history of gallstones and yet she had a perfectly normal gall bladder.

Appendicitis may also simulate duodenal ulcer so closely that it is not possible to make a diagnosis from the symptoms or clinical history. The following case illustrates such a condition:

P. K., male, age thirty-two, baker by trade, suffered for several years from periodical attacks of pain in the right hypochondrium. He suffered more or less at all times from hyperacidity and hunger pain, culminating every few months in a very severe attack of pain in the right hypochondrium, a spot of localized tenderness about an inch and a half in diameter situated an inch and a half above and to the right of the umbilicus, and rigidity of the upper part of the right rectus. There was never any tenderness at McBurney's point. The attacks usually began about midnight and reached their maximum intensity about four or five a.m. Nothing but morphine hypodermically would give any relief. I made a provisional diagnosis of duodenal ulcer and sent him into Nicholl's Hospital for x-ray. The x-ray examination showed the stomach and duodenum to be perfectly normal but the cæcum did not occupy the right iliac fossa but laid directly under the liver and there was considerable stasis at that point. I told him that I was satisfied that the trouble was in the appendix and advised removal. On March 13th, 1916, assisted by Drs. Neal and Mann, I operated and found the gall bladder and duodenum and stomach normal, and an appendix about four inches long in a state of chronic inflammation lying in the region which I have already indicated. He made an uneventful recovery and has been free from attacks since.

It is in cases such as the last two that I have mentioned, that the *x*-ray is invaluable in diagnosis.

Acute Gastritis. Here there is usually a definite cause for the attack. The history does not reveal periodic attacks coming on without apparent cause, and the pain and tenderness is more diffuse.

Gastrotoxic Conditions, especially when associated with hæmatemesis, may be difficult to differentiate. The tenderness in these cases will be more diffuse, there will frequently be symptoms of a general toxæmia, and the history will also serve as an important guide.

Acute Pancreatitis may simulate perforated gastric or duodenal ulcer very closely. This is shown very well by a case which Dr. Baker asked me to see with him last fall at St. Joseph's Hospital. The patient was an American lady about forty years of age, while up the lakes on a fishing tour was seized with very violent pain in the upper abdomen which passed through to the back. There was also severe vomiting and collapse. When she reached the hospital her condition was very grave. There was considerable abdominal distention and tenderness with some rigidity, and a mass about three or four inches in diameter, dull on percussion, could be plainly felt above and to the right of the umbilicus. Our diagnosis was between ruptured ulcer and acute gall bladder trouble. On opening the abdomen we found the mass which we felt to consist of œdematous omentum studded with areas of fat necrosis each about one-eighth inch in diameter. The pancreas was much swollen and infiltrated with clotted blood. We put in drainage and closed the abdomen but she died the next day.

Carcinoma. The diagnosis between carcinoma and the more acute types of ulcer is not usually difficult; but in the more chronic types of ulcer with much thickening of the stomach wall and perigastric adhesions the diagnosis may be as difficult as it is important. In all cases of gastric ulcer which have lasted for some years and in which the symptoms are getting more continuous, and especially if a tumour can be felt, cancer must be thought of. In such cases the chemical analysis of the stomach contents and the *x*-ray findings will be a great aid. Gastric ulcers are very prone to become malignant whereas duodenal ulcers rarely if ever do so.

Complications. The most important complication of either gastric or duodenal ulcer, in my opinion, is perforation; and it is by no means a rare occurrence. It may be either acute or chronic. In the chronic types sufficient irritation has been produced previously to form adhesions to surrounding structures, and thus limit the escape of gastric or duodenal contents. Ulcers on the posterior surface of the stomach are much less likely to perforate than those on the anterior surface or in the duodenum; and when it does occur is more likely to be of the chronic type. The reason for this is found in anatomical relations. The posterior wall of the stomach lies in contact with relatively rigid and immovable structures, it is therefore better supported and perigastric adhesions are more likely to form. The anterior surface on the other hand is in contact with less rigid and more movable structures, on this account protective adhesions are less likely to form, it is more liable to become distended, and is more subject to external trauma.

Perforation of a gastric ulcer is much more serious than that of a duodenal ulcer for two reasons:

1. The stomach contents are not so sterile as those of the duodenum.

2. The stomach is much larger than the duodenum, and there is likely to be a much larger quantity poured into the peritoneal cavity. The time at which perforation of a gastric ulcer occurs also influences the prognosis. If it occurs when the acid secretion is at its height the stomach contents are more nearly sterile then than at other times. Again if the stomach is distended with its contents a larger quantity will escape into the peritoneal cavity and a more widespread soiling occur than if it occurred when the stomach was empty.

Symptoms of Perforation. These differ according to whether the lesion is in the stomach or duodenum, and whether it is of the acute or chronic type. I shall speak of the acute type only. The patient is seized with sudden severe pain in the epigastrium, there is marked collapse, vomiting frequently occurs and the vomitus may contain blood. If seen early the abdominal muscles are very rigid, and there is marked tenderness above the umbilicus, the abdomen tends to be scaphoid. After a short time, especially in duodenal ulcer, the acute symptoms tend to pass off and we get what may be termed a latent interval lasting several hours, during which time the patient may feel and appear quite well. This is a very important point to remember in any case with a history at all suspicious of perforation, especially if not seen until two or three hours after the onset of symptoms. If perforation has occurred, I do not believe that the rigidity ever passes away completely and therefore is the one sign that must be looked for very carefully and if found operation should be insisted upon. The occurrence of a latent interval was impressed on my mind very forcibly by a case which I saw while in the London hospital, London, England. One morning a man was brought to the admitting department in the ambulance with the following history. He was walking along the street when he was suddenly seized with such a severe pain in the epigastrium that he fell. By the time he reached the hospital he had recovered somewhat, and the admitting surgeon being busy left him lying on the stretcher until his turn came which was about an hour and a half later. By that time he was feeling quite well. The examining surgeon made rather hasty examination, and came to the conclusion that there was nothing seriously wrong and allowed him to go home. Late that night the man was brought in again, suffering considerable pain, the abdomen was slightly distended, temperature and pulse were going up, he was admitted and operated on, a perforated ulcer was found, and he died the next day.

Therefore in any case with a suspicious history we should look carefully for the slightest trace of rigidity even though the patient appears perfectly well.

In perforated duodenal ulcers the fluid tends to gravitate to the right iliac fossa, and many of these cases have been mistaken for appendicitis. Moynihan, in 1901, collected forty-nine operations for perforation of the duodenum, eighteen of which had been diagnosed as appendicitis. The treatment of perforation is immediate operation. If operated on within the first six hours the mortality should not be more than two per cent., with each hour after that the mortality increases; if more than twenty-four hours elapse, unless the perforation is surrounded by adhesions, very few will recover.

In cases of acute perforation the history may not help us much in making a diagnosis. This is illustrated by the two following cases:

On July 31st, 1915, Mr. T. T., farmer, aged about fifty years, had pitched hay all day, came home to tea and was feeling so well that he went out to hoe in the garden. He had only worked a short time when he was seized with a sudden and very violent pain in the epigastrium. The pain was so severe that for a time he was unable to move. After a little while he was able to get to the house and called Dr. Russell of Baillieboro. The doctor thought he had a perforation and took him to Nicholl's Hospital in his own car. I saw him in consultation with Dr. Russell as soon as they arrived, and at that time the abdomen was extremely rigid and tender all over, but we thought that it was slightly more rigid on the right side than the left, though the difference was very slight. The abdomen was scaphoid and dull to percussion all down the right side. We came to the conclusion that it was either a case of perforated appendix or duodenal ulcer and advised immediate operation. We first made a short incision through the right rectus with its centre opposite the umbilicus. On opening the peritoneal cavity a considerable quantity of bile stained fluid escaped. We made a hurried examination of the appendix and found it normal. We enlarged the incision in the upward direction and found a punched-out ulcer in the duodenum about three sixteenths of an inch in diameter with considerable œdema of the intestinal wall around it but without any sign of obstruction. We stitched up the ulcer and closed the abdomen with drainage. He made an uneventful recovery and has enjoyed the best of health ever since.

The same week a middle-aged woman was sent in from the country to the Nicholl's Hospital, where I saw her in consultation with Dr. Neal. She gave the following history: She was wakened one morning about four a.m. with a very violent pain in the abdomen, accompanied with severe vomiting. The local physician was summoned, who thought she was suffering from acute intestinal obstruction. He gave her several enemas but no flatus or fæcal matter was passed. He advised her immediate removal to the hospital but owing to the distance from town and other obstacles she did not reach here until night. At that time she had much abdominal distention and was quite collapsed. We advised the friends that her condition was very critical, but that her only hope was in immediate operation, and it was their wish that it be undertaken. With the assistance of Dr. Neal I made an opening in the right rectus with its centre opposite the umbilicus, and on opening the peritoneal cavity a considerable quantity of bile stained fluid escaped. I enlarged the opening in an upward direction and in the duodenum we found a spot in which there were five or six small perforations, there was no sign of obstruction so we stitched up the lacerated area and closed the abdomen with drainage. She rallied somewhat for a time but towards the next evening she died. This goes to show that in order to get good results in cases of perforation operation must be undertaken early.

Hæmorrhage is sometimes a very troublesome complication, but considering the frequency of its occurrence it is not often fatal. In severe cases it may be very hard to determine whether the case should be treated medically or surgically. Generally speaking a first hæmorrhage is not often fatal, and for this reason one should try to avoid surgical procedure until the fluid content of the blood is restored and the shock recovered from. I feel strongly that this is the wise course to pursue, for under medical treatment, rest and rectal feeding, there is a strong tendency for such cases to improve; and cases that have suffered from severe hæmorrhage make very poor operative risks. I have found the intravenous injection of plain horse serum very beneficial in two cases that showed a tendency for the hæmorrhage to continue. While it is not generally considered good treatment to pass a stomach tube in the presence of hæmorrhage, if the stomach is filled with blood I believe it is wise to pass a soft tube and wash out the blood with cold water to which has been added some adrenalin solution. We know that a uterus will continue to bleed as long as it is in the uncontracted state, and I believe the same is true of the stomach, but of course in less marked degree. But a distended stomach is more likely to bleed than a contracted one, hence my reason for washing out. When, however, the patient has recovered from the effects of the hæmorrhage, I think it is much safer to operate than wait lest another and more severe hæmorrhage should occur. Of course this applies only to those cases in which we are certain that the hæmorrhage is due to ulceration. In cases associated with severe hæmorrhage we are debarred from using the opaque meal and the *x*-ray, or the test meals and stomach tube as a means of diagnosis, so that we have to depend largely on the previous history and physical signs for our diagnosis. If the history points clearly to ulcer I think our duty is to operate as soon as our patient has recovered from the effects of hæmorrhage.

The following case illustrates very well the tendency to continued bleeding in some cases and the benefit received from operation.

Miss E. F., aged fifty years, seen in consultation with Dr. Ross, of Keene, January 9th, 1916. She gave the following history: Family history negative except for the fact that several members of the family connexion had suffered from more of less severe attacks of anæmia evidently of the secondary type. In 1904 and 1905 she had vomiting spells every three or four weeks, with severe epigastric pain and hæmatemesis. The attacks then subsided and she was fairly well until she had an attack of rheumatism in 1910. In 1911 she had a very severe attack of pain in the right hypochondriac region, which was diagnosed as gall stones, and for which she had to have hypodermic injections of morphine. In 1915 she began to be troubled with hyperacidity, the distress coming on from one to two hours after food. This gradually increased until September, 1915, when the hyperacidity was accompanied by severe pain which she described as awful. In November, 1915, she began to vomit blood and would vomit bright red blood two or three times in each attack. She says she is sure that she vomited nearly two quarts in some attacks. Stools were always black at these times and would not clear up in the short intervals between the attacks. She was having from one to two attacks a week when I saw her with Dr. Ross. We advised her removal to the hospital and she was brought into the Nicholl's Hospital on January 12th, three days after the consultation. Her hæmoglobin at that time was 30 per cent., and her red blood count 1,850,000. By rest, rectal feeding and medical treatment she improved gradually until early in March she had a red blood count of nearly 4,000,000. On March 13th, 1916, assisted by Drs. Neal and Mann, I operated and found a good sized ulcer on the posterior wall of the stomach which I excised and did a posterior gastro-enterostomy. She made a rather tedious recovery at first but was able to leave the hospital in good condition in four weeks after the operation. Since leaving the hospital she has enjoyed perfect health. I saw her a few weeks ago and she said she had not been so well in fifteen years as she had been since the operation.

Pyloric obstruction is likely to occur in the case of chronic ulcers situated near the pylorus, and in chronic gastric ulcers situated away from the pylorus we may get marked stomach deformity, and in some cases hour-glass contraction. Pyloric obstruction may occur even in acute cases, when the ulcer occurs near the pylorus either on the gastric or duodenal side. The obstruction in these cases may be largely due to the pyloric spasm produced by the irritation of the ulcer, and the œdema around the ulcer may also produce considerable mechanical blocking. The obstruction in these acute cases is intermittent in character.

The following case was one of hour-glass contraction, due to an old saddle ulcer, and was referred to me by Dr. Sutton of Norwood.

Miss E. J., aged twenty years. Family history: Father was suffering from inoperable carcinoma of the stomach. He was treated for ulcer of the stomach seven years before, otherwise the family history was negative.

Personal History. Had rheumatism in 1910, following this she had some trouble with her stomach which was diagnosed as acute indigestion, then she began to vomit continuously and was in bed two weeks and treated for ulcer of the stomach. To use her own expression, after that she would feel dandy for two or three weeks then all-in for two or three weeks. She never vomited much blood, but had black stools quite often. For the week before coming to the Nicholl's Hospital she vomited almost continuously. The pain was excruciating in the epigastrium and radiated towards the left side, was relieved by soda and sometimes by food. I gave her a barium meal and examined her stomach with the *x*-ray and found she was suffering from an hour-glass contraction of the stomach. The constriction which was almost complete, was situated near the pylorus, and the fundus of the stomach was practically normal. On January 13th, 1916, I operated on her, assisted by Drs. Sutton and Neal. I found a complete constriction of the stomach in the region shown by the *x*-ray, and as there were a good many adhesions and the fundus was quite normal, I did a posterior gastro-enterostomy. She made an uninterrupted recovery and left the hospital on the twelfth day. I saw her a few weeks ago and she said she had enjoyed perfect health ever since the operation and gained thirty pounds. Generally speaking in these cases I believe that it is better to do a sleeve resection of the stomach than a gastro-enterostomy if conditions permit, for in doing so one not only relieves the obstruction, but removes the ulcerated area and with it the danger of the development of cancer later in life. In cases such as this, however, where the ulcerated part is bound down by dense adhesions, I think a gastro-enterostomy is the best procedure.

Carcinoma. The development of cancer from ulcer of the stomach and duodenum was for many years a debated question. Most observers, I think, are now willing to admit that gastric ulcer is a frequent precursor of cancer, but that duodenal ulcer has not the same tendency to become malignant. Wilson and McCarty, of the Mayo Clinic, have demonstrated the fact, that cancer frequently develops not from the base but from the overhanging edge of the ulcer. When it develops from the base of the ulcer, it is considered cancer from the beginning; but when it develops from the edge it is undoubtedly secondary to the ulcer. Von Eiselberg, in a paper published in the London *Lancet* in 1914, states that ten per cent. of the cases he had operated on for gastric ulcer subsequently died of cancer of the stomach. The father of the patient with hour-glass contraction which I have just reported goes to show the same thing. In 1909, he was treated for ulcer of the stomach, and he died in the fall of 1916 from cancer of the stomach.

Treatment. One is immediately confronted with the question are all cases of gastric and duodenal ulcers to be considered surgical? I would say quite emphatically no; but one should be constantly on his guard to determine when the case does pass from the realm of medicine to that of surgery and should not then temporize. There is a strong natural tendency for acute ulcers to heal. This has been proven by the rapidity with which healing has been observed to occur in ulcers produced experimentally. In such cases therefore medical treatment and not surgical is indicated. To be effective, however, the treatment must be carried out very rigidly.

1. Rest in bed for four to eight weeks.
2. Total abstinence from food for at least a week or longer if the symptoms are not subsiding, the patient being fed in the meantime by nutrient enemata.
3. If hæmorrhage has been severe, an ice bag to the stomach, horse serum intravenously and morphia hypodermically.

By these means a large number can be relieved and some cured. Of course it is always hard to say how many are cured even though the symptoms subside, for we know the strong tendency there is to remission in these cases. Acute cases which do not improve under medical treatment, cases with severe or recurrent hæmorrhage, and all subacute and chronic cases should be considered surgical. The tendency for gastric ulcers to become cancerous must not be forgotten, and on this account any case in which gastric ulcer has been positively demonstrated, by *x*-ray or otherwise should be operated on and the ulcer excised. Dr. Balfour, of the Mayo Clinic, devised a means of removing the ulcer by means of the thermo-cautery. It is undoubtedly a very excellent and simple method and is fully described in the "Mayo Clinics".

The form of surgical procedure adopted in a given case will depend on the nature of the case and the judgement of the operator. All operative procedure has two ends in view, viz.:

1. The relief of pyloric spasm or obstruction.
2. The modification of the acidity of the gastric juice so as to facilitate the healing of the ulcer.

To attain this end one of two procedures may be adopted. A gastro-enterostomy may be done or some plastic operation on the pylorus. Generally speaking a gastro-enterostomy of the posterior type is to be preferred. The mortality is lower and the end results better. The physiological results of gastro-enterostomy have been carefully studied by many competent observers, and their investigations go to show that by it the acidity of the gastric juice is permanently lessened in some cases as much as thirty per cent.

The question of blocking the pylorus is one on which many surgeons differ. The indications for blocking I consider to be, severe hæmorrhage and acute perforation; other cases I think do fully as well or even better without blocking. In any case if there are many adhesions which would make blocking difficult it is better not to do it.

Prognosis, in the case of gastro-enterostomy for duodenal ulcer, is good. In the case of gastric ulcer the prognosis is more uncertain. It is very hard to estimate the benefit derived from operation by means of statistics, for statistics necessarily cover a period in which gastric surgery was not so well understood as it is at present, and cases then were not considered surgical at as early a period in their history as they are now. Furthermore it is only in the last few years that the tendency for gastric ulcers to become cancerous has been appreciated, and the necessity for the excision of all gastric ulcers recognized.

Complications following gastro-enterostomy:

1. Hæmorrhage has occurred in a small percentage of cases, but if due care is exercised at the time of operation in producing hæmostasis there will be no trouble.

2. Vomiting was a troublesome feature after operation in about 10 per cent. of cases in the early days of gastro-enterostomy, but since the adoption of the no-loop method of operation it is practically never met with.

3. Jejunal ulcer occurs in a small percentage of cases after gastro-enterostomy. It is usually situated in the jejunum just beyond the gastro-enterostomy opening. Many cases of recurrence are no doubt due to the use of permanent suture material at the time of operation as the Mayos have shown; but it may occur even in cases where no permanent suture material has been used. The following case illustrates this condition:

Mrs. McB., age thirty-six, operated on five years ago for duodenal ulcer, when a posterior gastro-enterostomy was done. She enjoyed very good health for about four and a half years when she began to suffer from attacks of pain, hyperacidity and vomiting. The pain gradually became more severe and the vomiting more persistent. The attacks were particularly prone to come on at night. Finally the obstruction became almost complete. I gave her a barium meal and *x*-rayed her, and made a diagnosis of jejunal ulcer. She also saw Dr. Halliday who concurred in my opinion that operation should be undertaken as soon as possible. She went into the Nicholl's Hospital on January 1st, 1917, and I operated the following day assisted by Drs. Halliday and Scott. At operation we found an ulcer in the jejunum, about three quarters of an inch in diameter, situated in the jejunum just beyond the gastro-enterostomy opening. We separated the old gastro-enterostomy opening, excised the ulcer and stitched the opening up in such a way as to leave the gut patent, then made a new gastro-enterostomy. She had no vomiting after the operation, the pain subsided and she went home perfectly well on the twelfth day.

Case Reports

TRANSFUSION IN RUPTURED ECTOPIC PREGNANCY

By N. H. Beal, M.D., F.A.C.S.

Associate Professor of Surgery, Western University Medical School, London, Ontario

On February 10, 1917, the writer was called in consultation by Dr. Homer McLay of Aylmer, Ontario, from whom the following history was obtained:

Mrs. E. V. P., aged thirty-eight, had been seized that morning, at 7 A.M., with severe pain in the right lower quadrant of the abdomen accompanied by marked collapse. She is the mother of a child eight months old, and had menstruated regularly for several months. Her last period began on December 3, 1916.

Dr. McLay saw the patient at 3.30 P.M., and found her in a serious condition, pulse rapid and at times imperceptible, pallor and the other signs of internal hemorrhage being well marked. The diagnosis of ruptured ectopic pregnancy was made.

Owing to the condition of the roads the writer did not see the patient till 10 P.M. Dr. McLay's diagnosis was confirmed, and operative interference was considered imperative. The patient was so weak from loss of blood that it was not safe to open the abdomen. The transfusion of blood was decided upon. This was rapidly carried out, using the Unger method.* Circumstances did not permit using paraffin in the rubber tubing, but sterile albolene was run through the instrument. The father, a robust man of seventy, was the donor, and 960 c.c. of his blood was transfused without any preliminary agglutination tests. The usual phenomena following transfusion occurred, colour returning, respirations becoming slower, pulse dropping in rate and becoming fuller.

Preparations had already been completed for a laparotomy, which was immediately performed, the right tube being removed and abdomen cleared of clots and blood. The convalescence was uneventful, the patient sitting up on the twelfth day.

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*Unger, *J. Am. M. Ass.*, 1915, lxiv. 582.

COMMENT

1. The transfusion of blood was life-saving in a case of ruptured ectopic pregnancy.

2. The use of the Unger method in a country farm house indicates the adaptability of this method to circumstances where hospital facilities are not at the command of the surgeon.

3. No preliminary blood examination of the donor and recipient was made in an emergency case with no untoward effects.

DURING the twelve months ending November 30th, 1916, patients to the number of 12,590 received treatment in the Winnipeg General Hospital, the total number of hospital days amounting to 192,990. Four hundred and thirty-six deaths occurred, a percentage of 3·45, or 2·53, if those occurring within forty-eight hours of admission are deducted. The births numbered 583. Over five thousand operations were performed, and the ambulance made 2,858 journeys. In the outdoor clinic 7,131 patients were treated. The year was a satisfactory one, for although the number of patients treated was greater than ever before, the death rate was lower than in any previous year. Additional accommodation for seventy patients has been provided by the enlargement of the Jubilee wing and two floors of this building have been reserved for the use of military patients. The building formerly used as a maid's home has been converted into a pathological building. The Board hopes to be able to add new power and service buildings during the present year, and in the near future to establish a psychopathical and neurological department in the hospital.

Editorial

THE ANNUAL MEETING

THE forty-eighth annual meeting which will be held in Montreal, June 13th, 14th, and 15th, bids fair to be an unqualified success. In spite of war conditions which place many limitations upon the scope of such a meeting, it is confidently expected that both in point of attendance and in the excellence of papers to be contributed, this meeting will be in no way behind former gatherings of the Association. The members of the profession in Montreal are looking forward to welcoming a large number of their brethren from all parts of the Dominion. It is the intention to publish a complete preliminary programme some time about the middle of May so that we will here only indicate in a general way an outline of the proceedings on each day of the meeting.

On the morning of the first day there will be a general session of the Association, after which luncheon will be served to the members in the College building, where all the meetings are to be held. For the convenience of the members, and in order to save time, it is the intention of the committee of arrangements to serve luncheon to the members on each of the three days. In the afternoon there will be meetings of the various sections, and in the evening the address in public health, by Dr. Charles H. Hastings, of Toronto. This meeting will be open to the public, the subject being, "The national importance of public health."

On the second day, sections will meet during the first part of the morning, and at eleven-thirty the address in medicine will be delivered. The Association is fortunate in having Dr. Theodore C. Janeway, of Baltimore, to give this address. In the afternoon, following a meeting of sections, there will be a symposium on the subject of "Suppurative conditions in the lower respiratory tract". This will be participated in by the sections of medicine, surgery, pathology and x-ray, and prominent speakers in each of these departments are being secured. In the evening the annual dinner will be held, and on this occasion, the President, Dr. Blackader, will deliver his address.

The address in surgery will be given on the morning of the third day following upon the usual meetings of sections. This address will be given by Dr. F. J. Shepherd, of Montreal. In the afternoon of this day the sections will meet again.

We have received from Dr. R. W. Powell, of Ottawa, intimation that the Canadian Medical Protective Association will hold its meeting at the time of the meeting of the Association. Dr. Powell points out that as no meeting has been held for two years, there will be some very important business to be brought before the members. The hour of the meeting will be published in the preliminary programme.

In addition to the scientific attractions of the meeting there will probably be some opportunity afforded for a visit to the large hospitals of the city. We can assure our members that a hearty welcome will be extended to those who may be able to come to Montreal for this purpose for the two days preceding the meeting, or to remain for the day following.

HELIOTHERAPY

SINCE the appearance in 1909 of Rollier's[1] article upon the treatment of surgical tuberculosis by general heliotherapy, based upon results obtained at Leysin, there has been a gradually awakening interest and belief in the curative action of the sun's rays and their value as an adjuvant in the treatment of these conditions.

So far there would appear to be no unanimity of opinion as to what rays are most beneficial; but the results more recently obtained would seem to discredit the primary assumption that the rays at high altitudes were superior, in quality, quantity, and curative effect, to those in the lowlands.

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[1] Rollier: "Heliotherapy in Mountain Climate." *Bull. de l'Académie de Médecine*, Paris, November, 1909.

"Heliotherapy of Tuberculosis with special reference to the surgical forms." *Ergebnisse der Chirurgie und Orthopädie*, 1913, Bd. 7.

General heliotherapy is to be preferred to local heliotherapy for the following reasons: (1) because local foci are, so to speak, merely the outward expression of generalized infections; and (2) because successful general insolation is followed by extraordinary tonic effects. There is an increase in the red blood cells and in their hæmoglobin content, and in typical cases the leucocyte count rises to about 13,000. From the results obtained in the treatment of pulmonary tuberculosis by general heliotherapy at the Mesnaliens Sanatorium in Norway, Holmboe[2] affirms that, while it is too early to define the direct influence of sun baths upon such lesions, they unquestionably have a very stimulating effect upon the appetite; and that the improvement in the subjective health of the patient is so striking that it must be considered of great significance.

The local effects of general heliotherapy are best shown in sinus cases, in which healing is greatly accelerated, with the formation of movable cicatrices, that show less tendency to keloid formation than is usually observed. Rollier[1] claims that in joint affections mobility and not ankylosis is to be looked for, but this is a matter of controversy.

In city hospitals, where there are no facilities for carrying out general heliotherapy, the local exposure of lesions, especially bone and joint sinuses and superficial tuberculous ulcers, is attended with remarkable results. The writer has had experience of cases of tuberculous skin ulcers following the spontaneous evacuation of tuberculous glands, which obstinately resisted local treatment where dressings and bandages were applied, but which, after a surprisingly short period of daily exposure to sunlight, healed promptly and with comparatively little scarring. In general hospitals, too, such cases as those cited by the author of the original contribution in this issue, especially cases of tuberculous peritonitis, receive distinct benefit from exposure of the abdomen to the sun's rays. The therapeutic value of sunlight in the treatment of septic wounds and of pyogenic infections of bones, with sinus formation, has been attested by Grangé,[3] and is worthy of further trial.

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[2] Holmboe: "Heliotherapy for Tuberculosis in Norway." *British Journal of Tuberculosis*, July, 1916.

Careful observations upon general insolation have led to certain broad generalizations:

1. That the treatment is of value only when it produces pigmentation.

2. That pigmentation alone is not sufficient to produce improvement, but is a medium through which improvement is obtained.

3. That in pigmented patients who show improvement the degree of improvement bears a certain relationship to the amount of pigmentation.

4. That in patients who do not pigment, especially in sandy-haired patients in whom there appears to be a lack of pigmenting power, the ultimate prognosis is not so good as in patients who do pigment.

Campbell[4] of Memphis states that, contrary to his earlier impressions, negroes respond to heliotherapy equally as well as whites, and undergo further pigmentation.

Gauvain[5] contributes the interesting observation that patients who have not pigmented, even though the disease appears to be quiescent, often develop later lesions or abscesses elsewhere; and that the successful aspiration of these abscesses or the healing of local lesions may in this hitherto non-pigmenting class be followed by the acquirement of pigmenting power. Pigmentation is thus often an excellent prognostic sign.

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[3] Grangé: *Paris Médical*, December 25th, 1915.

[4] Campbell: "General Heliotherapy in the Treatment of Bone and Joint Affections." *American Journal of Orthopedic Surgery*, April, 1916.

"Bone and Joint Affections treated by Heliotherapy." *American Journal of Orthopedic Surgery*, January, 1917.

[5] Gauvain: "The Practical Employment of Heliotherapy in Surgical Tuberculosis occurring in Children." *British Journal of Tuberculosis*, July, 1916.

Patients should be carefully supervised, especially while pigmentation is being induced. A useful table of instructions for nurses and others in the conduct of sun treatment is appended to Gauvain's[5] article. Holmboe[2] also gives some very instructive comparative tables of temperatures taken with the ordinary mercurial thermometer and the so-called "insolation" thermometer, which records only the heat of the sun's rays, regardless of the heat of the surrounding air.

While those who have had experience with heliotherapy are convinced of its value, they lay stress upon the fact that it must not be considered as a treatment in itself, but rather as an adjuvant; and that the orthopædic and other appliances which are being used to overcome and prevent deformities, should during the period of insolation be frequently supervised and carefully re-adjusted.

NITROUS OXIDE-OXYGEN ANALGESIA IN OBSTETRICS

THE use of nitrous oxide and oxygen as an analgesic and anæsthetic to alleviate the sufferings of childbirth is not new, but it has become the vogue to a large extent on this continent since the general abandonment of the so-called "twilight sleep".

The general use of morphin-scopolamin was largely due to public demand, and was to a certain extent hysterical, being exploited in the lay press and discussed at women's meetings from one end of the country to the other.

It proved a disappointment in its results, for, according to conservative estimates, in only about one-third of cases was it entirely successful; in one-third of cases it was of no benefit, and in the remaining cases it was actually more of a curse than a blessing.

Nitrous oxide and oxygen, on the other hand, appears to have a very useful future in this field. The very drawbacks to its use in general surgery make its strong points as an analgesic agent for obstetrical use. It does not produce great relaxation of the muscles, rather stimulating the pains of labour by removing inhibitory fear from the patients. Also, it is possible to oxygenate the patient thoroughly, because the administration is intermittent, only lasting for the period of each pain, so that no cyanosis or excess of carbon dioxide need be produced; and, if produced, it can be corrected at once by giving pure oxygen. It has the inestimable advantage over the alkaloid method of continuous application and quick elimination. Further, it may be used in practically every patient who presents herself, without the necessity of careful selection of cases, because it has practically no toxic action.

First used in Russia in the eighties with success, it was lost sight of for a long time; but in this country and in the United States it has been employed a great deal for the last five years with good results.

There are certain objections to the method, which may be overcome to a large extent as it becomes more popular. Its cost is rather prohibitive for the charity patient, running around seven dollars an hour in this country. Besides, considerable training and practice in its administration are absolutely necessary to success. Another essential is a good apparatus. There are a number of machines on the market to choose from. The obstetrician or anæsthetist will do well to choose one which allows of the addition of pure oxygen to nitrous oxide in any quantity, particularly at the end of each pain, also at the completion of childbirth, during the very last part of which he has probably produced complete anæsthesia and some accompanying cyanosis.

On March 27th, last, four physicians were brought before the police court at London, Ontario, to answer to a charge of unlawfully prescribing intoxicants in evasion of the Ontario

Temperance Act. In one case it was stated that no less than seven hundred and eighteen prescriptions for intoxicating liquor had been given by the doctor in question since September 16th, 1916. Such a number of prescriptions for bottles of liquor would appear to be excessive, and in the opinion of most members of the profession, there is very little difference between pandering to a man's appetite for drink and giving morphia or cocaine to a drug habitué.

An Order-in-Council has been passed by the government which provides for the issuance of war badges. The badges will be of four orders and will be distributed to (a) men honourably discharged after actual service at the front; (b) those honourably discharged after six months' service in the Canadian Expeditionary Force, or for less than six months' service, provided that the discharge was by reason of some disability due to military service; (c) those honourably discharged after less than six months service in the Canadian Expeditionary Force, or those who have volunteered to enlist but have been rejected as medically unfit; (d) those who have volunteered to enlist but whose services have been refused on the ground that they would be more useful to the State in their actual occupation than if they enlisted. No badge will be issued to men discharged by reason of the cessation of working pay, if they are still fit for overseas service. The order provides for the free issue of these government badges and makes it illegal to manufacture, sell, purchase or wear any other badge purporting to be for such purposes as are provided for in the Order-in-Council, and any infraction of the order will be punished by a fine not exceeding five hundred dollars or by imprisonment not exceeding six months.

In a recent debate in the British Columbia House of Assembly, Dr. J. W. McIntosh, of Vancouver, referred to the unsatisfactory way in which problems connected with public health were dealt with in the province of British Columbia. In Vancouver, the death rate from tuberculosis, instead of decreasing, has increased by 43 per cent. during the period elapsing between the years 1904 and 1914, and in Victoria during the same period it has increased by 58½ per cent.; and in Vancouver 15 per cent. of all deaths are due to tuberculosis. Dr. McIntosh contrasted these figures with those for the province of Ontario, where the death rate from this disease has diminished by as much as 40 per cent. during the period mentioned. The speaker also pointed out the importance of segregation and objected to the methods in vogue in the hospitals where advanced and incipient cases are often treated side by side. He thought that incipient cases only should be admitted to the Tranquille Sanatorium. The late government had given generous aid to the hospitals and had provided for the treatment of advanced cases of tuberculosis, but such cases ought not to be admitted to the common wards of a hospital. A good deal had been accomplished in the province by the employment of the tuberculin test in cattle and the examination of milk, and within the next three or four years the cattle of British Columbia should be free from infection and thus a grave menace to the health of the public generally, and children particularly, would be removed. Dr. McIntosh thought that all meat should be inspected and that it was only a question of time before the Workmen's Compensation Act would be extended to include sickness as well as accident. In reference to the present system of education, he said that in England the trend of opinion was strongly in favour of vocational education. The present system gave a superficial knowledge of many subjects. He thought that education should be along the lines of development in the province; for instance, the fishing industry in those parts of the British Columbia where fishing was the principal occupation of the people.

Canadian Medical Association

ANNUAL MEETING, MONTREAL, JUNE 13TH TO 15TH

PRELIMINARY PROGRAMME (APRIL, 1917)

ADDRESS in Medicine: Theodore C. Janeway, M.D., Sc.D., Professor of Medicine, Johns Hopkins Hospital, Baltimore.

Address in Surgery: F. J. Shepherd, M.D., LL.D., F.R.C.S., Montreal.

Address in Public Health and Preventive Medicine: Charles J. Hastings, M.D., Medical Officer of Health, Toronto.

SECTION OF MEDICINE

J. S. Wright, Edmonton: "The sociologic and economic aspect of tuberculosis."

Robert C. Paterson, Saranac Lake: "Tuberculin, its nature and action."

J. Roddick Byers, Ste. Agathe des Monts: "Vocational training in the treatment of pulmonary tuberculosis."

James Third, Kingston: "Tuberculosis, a national problem."

Hugh M. Kinghorn, Saranac Lake: "Rest and exercise in the treatment of pulmonary tuberculosis."

W. B. Kendall, Gravenhurst: "Clinical report of one hundred cases of artificial pneumothorax."

W. Goldie, Toronto: "Neurasthenia as a symptom complex."

E. H. Mason, Montreal: The value of the atropine test in the diagnosis of typhoid fever."

E. Grenier, Montreal: "Artificial pneumothorax in the treatment of pulmonary tuberculosis."

W. G. Hepworth, Steveston, British Columbia: "A primary attack of pulmonary asthma in a pregnant multipara."

Maude E. Abbott, Montreal: "On the determination of basal metabolism by indirect calorimetry."

Walter M. Boothby, Rochester, Minn., and Maude E. Abbott, Montreal: "On the basal carrying tension of the blood for carbon dioxide in congenital cardiac lesions."

H. A. McCallum, London: (To be announced.)

G. G. Campbell, Montreal: "Use of liquid air treatment of skin diseases."

Thomas McCrae, Philadelphia: "Some of the medical problems of gall-bladder disease."

J. S. Graham, Toronto: "Observations in the removal of septic foci in cases of chorea."

G. S. Mundie and I. J. Erickson, Montreal: "Cerebro-spinal lues."

I. J. Erickson and E. H. Mason, Montreal: "Blood pressure and kidney function findings in orthostatic albuminuria."

W. H. B. Aikins, Toronto: "Radium in the treatment of tuberculosis of the skin."

W. F. Hamilton, Montreal: "Pancreatic cyst, three cases."

H. A. Bray, Ray Brook, New York: "Apical breath-sounds in early tuberculosis."

A. McPhedran, Toronto: "Prognosis in diseases of the heart."

A. G. Morphy, Montreal: "The diagnosis of disseminated sclerosis."

Helen MacMurchy, Toronto: "Care and treatment of the feeble minded."

J. Kaufmann, Montreal: "Significance of an abnormal cardiographic T-wave in relation to high diastolic pressure and low pulse pressure."

J. Kaufmann and H. H. Cheney, Montreal: "Pneumothorax; a clinical and radiological study.

SECTION OF SURGERY

James McKenty, Winnipeg; "Duodeno-jejunostomy; its indications and technique."

Robert E. McKechnie, Vancouver: "The action of wood alcohol in surgical cases."

W. E. Gallie and E. L. Robertson, Toronto: "The transplantation of bone."

Charles K. P. Henry, Montreal: "The surgical treatment of pernicious anæmia."

W. A. Lincoln, Calgary: "Spontaneous rupture of the renal artery."

J. A. Nutter, Montreal: "Arthrodesis of the hip joint and its indications."

G. S. Mundie, Montreal: "Ionization in the treatment of stiff joints."

R. Tait McKenzie, Philadelphia: "On the treatment of muscle and joint contractures by physical methods."

J. E. Lehmann, Winnipeg: "Some observations on mutilating traumatism of the upper extremity."

F. N. G. Starr, Toronto: "The radical cure of hernia."

D. E. Robertson, Toronto: "Empyema."

Roscoe Graham, Toronto: "A study of Meckel's diverticulum."

James Cotton, Toronto: "A demonstration of the new ether."

D. W. MacKenzie, Montreal: "Vesical symptoms in renal disease."

N. H. Beal, London: "Abdominal surgery as an aid in the treatment of pulmonary tuberculosis."

Lieutenant-Colonel F. G. Finley, B.E.F.; "Trench nephritis."

Major S. Aylwin Smith, B.E.F.: "Technique of nerve suture."

Major G. Peat, B.E.F.: "The effect of gassing."

Major John Meakins, B.E.F.: To be announced.

Major A. W. W. Ellis, B.E.F.: To be announced.

Captain John Parry, B.E.F.: "Treatment of injuries of peripheral nerves."

Lieutenant-Colonel C. B. Keenan, C.A.M.C.: "Bone grafting."

Combined Sections

DISCUSSION ON "SUPPURATIVE CONDITIONS IN THE LOWER RESPIRATORY TRACT"

Medical: (To be announced.)
Surgical: E. M. von Eberts, Montreal.
Pathological: J. J. MacKenzie, Toronto.
X-ray: W. A. Wilkins, Montreal.

X-Ray Section

H. H. Cheney, Montreal: "The use of *x*-ray in gastro-intestinal diagnosis."

F. S. Pepperdene, Toronto: "Treatment of diseases with *x*-rays."

W. A. Stenning, Sherbrooke: "Duodenal ulcer."

Captain J. F. Morgan, C.A.M.C.: "*X*-ray at a base hospital in France."

Captain A. Howard Pirie, C.A.M.C.: "The inefficiency of the modern German shrapnel ball."

W. A. Wilkins, Montreal: "Pulmonary abscess."

H. M. Tovell, Toronto: "The importance of the *x*-ray examination in the diagnosis of gastric carcinoma."

J. E. Panneton, Montreal: "The *x*-ray treatment of fibroma."

G. E. Richards, Toronto: "The Roentgen diagnosis of chronic appendicitis."

The work of this section will also include a visit to the *x*-ray departments of the Montreal General and Royal Victoria Hospitals. There will be the usual interesting display of plates.

SECTION OF OBSTETRICS AND GYNÆCOLOGY

G. G. Copeland, Toronto: "Blindness in the new-born."

G. S. Cameron, Peterborough: "Unusual complication of pregnancy."

G. S. Cameron, Peterborough: "Cardiac vascular disease in fibromyomata."

S. P. Ford, Norwood, Ont.: "An obstetrical experience of thirty-five years."

J. Duncan, Montreal: "Induction of labour."

J. R. Fraser, Montreal: "Pyelitis in pregnancy."

F. A. L. Lockhart, Montreal: "A note on the use of the stem pessary in dysmenorrhœa."

L. deL. Harwood, Montreal: "Drainage in pelvic surgery."

B. P. Watson and W. A. Scott, Toronto: "Analysis of clinical types of puerperal sepsis, with special reference to prognosis and treatment."

G. Hall, Montreal: "A few prescriptions."

D. Patrick, Montreal: "Treatment of sterility by intubation."

SECTION OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY

D. J. Gibb Wishart, Toronto: "Remarks upon the treatment of ozœna by means of polyvalent vaccines, after Horn."

Lieutenant-Colonel S. Hanford McKee, C.A.M.C.: To be announced.

A. Bramley Moore, Montreal: "Injuries to the eye caused by breaking of eyeglasses."

F. T. Tooke, Montreal: "Complications of senile cataract extraction."

W. G. M. Byers, Montreal: "Surgical treatment of glaucoma with special reference to the more recent operations in the field."

H. D. Hamilton, Montreal: "Retro-pharyngeal abscess."

George H. Mathewson, Montreal: "Damage caused to the eye by strong light."

J. E. Hett, Kitchener, "Focal infection of the tonsils."

R. S. Minnes, Ottawa: "Report on two cases of acute mastoiditis following measles with thrombosis of (a) lateral sinus, (b) jugular bulb."

W. G. Putnam, Yarmouth: "Some dislocations of the crystalline lens."

J. Rosenbaum, Montreal: "Congenital bilateral anophthalmos."

SECTION OF PUBLIC HEALTH

D. Boucher, Montreal: "Teaching of hygiene; its necessity."

P. H. Bryce, Ottawa: "Why federal legislation is necessary in order that venereal diseases may be effectively dealt with in Canada."

W. S. McCullough, Toronto: "Medical examination of immigrants."

E. Pelletier, Montreal,: "How to organize effectively public health service in rural municipalities."

M. M. Seymour, Regina: "Hospitals in rural districts."

E. Nadeau, Quebec: "Rational town planning."

J. E. Dubé, Montreal: "The anti-alcoholic war and the medical profession."

J. A. Baudouin, Lachine, Que.: Sanitary records of houses."

P. H. Bryce, Ottawa: "How a medical health officer can become a co-operative social force in rural districts."

G. G. Melvin, St. John: "Medical inspection of schools."

W. H. Hattie, Halifax: "Terminal disinfection."

T. R. Adams, Ottawa: "The public health aspects of town planning."

Symposium on the Teaching of Hygiene

Speakers: Dr. S. B. Boucher, F. B. Jones, Montreal; J. G. Fitzgerald, Toronto; M. A. H. Mackay, Halifax.

Symposium on Venereal Diseases

LABORATORY SECTION

E. H. Mason, Montreal: "On the functional diagnosis of kidney disease."

Louis Gross, Montreal: "Reconstructions of circulation in the kidney and their bearing on the pathology of the organ."

Maude E. Abbott, Montreal: "The Haldane portable gas analysis apparatus for the clinical estimation of carbon dioxide and oxygen in the determination of acidosis and basal metabolism."

D. D. MacTaggart, Montreal: "Medical jurisprudence in civil law."

A. Vallée, Quebec: "Multiple infarcts of the spleen in malignant endocarditis, rupture of the spleen and peritonitis."

S. J. S. Peirce, Winnipeg: "Wassermann chart with some notes towards standardization of the Wassermann technique."

Maude E. Abbott, Montreal: "Development of the heart in explanation of certain congenital cardiac lesions."

C. T. Crowdy, Montreal: "On hypernephromata and renal cancers."

Henry Odland, Montreal: "Trinitrotoluene poisoning."

A. A. Bruère, Montreal: "On a method of estimating the amylase of urine."

Horst Oertel, Montreal: "Certain factors influencing the production of jaundice."

A. A. Bruère, Montreal: "On the value of preserved alexin (guinea pig serum) in complement fixation tests."

V. J. Harding and E. H. Mason, Montreal: "The estimation of chloride in blood."

William Boyd, Winnipeg: "Acute adrenal insufficiency."

D. G. Revell, Edmonton: (To be announced.)

Exhibition of specimens.

Military Section

Several papers have been promised which will be found for the present under the Surgical Section. The chairman of the Military Section is assured of a sufficient number of papers to make this part of the programme a success from every standpoint.

RAILWAY RATES

The usual reduced rates have been arranged on all the Canadian roads terminating in Montreal. These special rates may be obtained by doctors attending the meeting, and by members of their families accompanying them.

In order to take advantage of these rates it will be necessary for the physician when starting, first, to purchase a single first-class ticket (which must cost not less than 50c.) to place of meeting, and second, to obtain from his ticket agent a standard certificate properly filled in and signed by the latter. This must be presented to the General Secretary of the Association when registering at the meeting. It will be filled in by him and viséd by a special agent of the transportation companies, who will attend for this purpose on the 14th and 15th, and who will collect the sum of 25c. for each certificate examined. The presentation of this form properly filled in and viséd will entitle the holder to a return ticket to his home either free of charge or at two thirds, or one third, the regular first-class fare, depending on the number attending the meeting.

From points east of Fort William, Ontario, tickets must be bought between June 9th and June 15th, inclusive, and the return journey may be made up to and including June 19th, 1917. From points west of Fort William, and Armstrong, Ontario, tickets must be bought between June 8th and 11th, inclusive; from British Columbia between June 6th and 9th, inclusive. Certificates for the return journey to the west will be honoured at Montreal up to and including June 19th, 1917. A thirty-days' extension may be secured by the additional payment of one third the full fare from place of meeting to starting point. Stop-overs will be granted holders of these extended tickets.

The trip to Montreal by boat, particularly at this time of the year, is very delightful, and we would point out to our members that the above special rates apply as well to the boats of the Canada Steamship Lines, as to the railways.

It is hoped that our members will note that it is important to fulfil all the conditions mentioned above, and it should be emphasized that the greater the number attending, the less will be the cost of railway transportation. Any member requiring special information with reference to transportation is requested to write to Dr. H. B. Carmichael, Chairman of Transportation Committee, General Offices, Grand Trunk Railways, Montreal.

HOTELS

Montreal has many first class hotels, and the majority are within easy reach of the New Medical Building, where all the meetings will be held. The following are the principal ones with their rates.

Windsor, Windsor St. (near C.P.R. depot), single $2.00 up; double $3.50 up; with bath $1.00 additional.

Ritz-Carlton, cor. Sherbrooke and Drummond, single, with bath, $2.00 up; double, with bath, $5.00 up.

Corona, Guy St., single, $1.50, double, $2.50; with bath $1.00 additional.

Queen's, Windsor St. (near G.T.R. depot), $1.50 and $2.00, (with bath $2.50). American plan, $3.00 and $3.50 (with bath, $1.00 additional).

Welland, McGill College Ave., $1.00 and $1.25; American plan, $2.50 and $3.00.

Miscellany

Book Reviews

THE PRACTICAL MEDICINE SERIES: COMPRISING TEN VOLUMES ON THE YEAR'S PROGRESS IN MEDICINE AND SURGERY. Under the editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. VIII, MATERIA MEDICA AND THERAPEUTICS, edited by GEORGE F. BUTLER, Ph.G., A.M., M.D., emeritus professor of therapeutics, Chicago College of Medicine and Surgery. PREVENTIVE MEDICINE, edited by WM. S. EVANS, M.A., M.D., L.L.D., Ph.D., professor of preventive medicine, North Western University Medical School. Series 1916. Publishers: The Year Book Publishers, 327 S. La Salle Street, Chicago. Price, $1.50 net. Price of the series of ten volumes, $10.00.

This little work puts before the profession the lastest advances in Therapeutic and Preventive Medicine in very readable form. One is perhaps struck with the space devoted to "Extracts of Animal Organs and Serums", but the rapid advances here require all the attention given. That portion devoted to Preventive Medicine is practical and should be very valuable to the general practitioner. The opening chapter on the "Physician and Public Health Work" is good.

DISEASES OF CHILDREN. By EDWIN E. GRAHAM, A.B., M.D., professor of diseases of children in the Jefferson Medical College. 902 pages with 89 engravings. Publishers: Lea & Febiger, Philadelphia and New York, 1916. Price $6.00 net.

We have carefully examined this new text-book on diseases of children and can congratulate the author upon having most satisfactorily accomplished his aim to present modern views in such a way as to render them immediately available to the busy practitioner. Throughout the volume the anatomy and physiology of the child are carefully considered and while pathology is given due consideration, symptoms, diagnosis and treatment, claim the chief attention. The subject of infant feeding is very fully discussed and the modification of cow's milk to suit the digestive capacity of the infant carefully explained. Numerous formulæ are included to illustrate the calculation of caloric and percentage feeding. We have read with pleasure the chapters devoted to infant mortality, heredity and environment, dentition, puberty, fresh air; and the article on poliomyelitis is an excellent one. The author expresses his views clearly and well. We welcome this new arrival to our shelves. We have consulted it on many occasions and can strongly recommend it as modern, practical and thorough.

MENTALLY DEFICIENT CHILDREN, THEIR TREATMENT AND TRAINING. By G. E. SHUTTLEWORTH, B.A., M.D., fellow of King's College, London; and W. A. POTTS, M.A., M.D., medical officer to the Birmingham Committee for the care of the mentally defective. Fourth Edition, 284 pages. London: H. K. Lewis & Co., Ltd., 136 Gower St., W.C. Philadelphia: P. Blackiston's Son & Co., 1916. Price, 7/6 net.

It is a matter of great regret that in Canada so little has been done towards the training of mentally deficient children. In this matter we are much behind many countries in Europe and also many of the States in the Union. We have much pleasure therefore in recommending this work to those physicians who are interested in this class of case, as being very practical and suggestive. It is the fourth edition, and has been very carefully revised and brought well up to date and should be in the hands of every physician who has many children under his charge. It is one of the best and most practical and at the same time most readable text-books on this subject.

THE CONTROL OF HUNGER IN HEALTH AND DISEASE. By ANTON J. CARLSON. University of Chicago Press, Chicago, 1916.

THE investigation of the bodily functions, either separately or as a whole, by the usual methods in vogue in the physiological laboratory is seriously limited, because objective phenomena alone can, as a rule, be studied. Such physiological processes as involve subjective experiences on the part of the observed animal, cannot be satisfactorily investigated unless at least some of the fundamental experiments are performed on man himself. The significance of the sensations of hunger and appetite, and the relationship of these sensations to the processes of digestion, serve as excellent examples of the case in point, and it must be considered as marking a distinct contribution to the development of physiological and therefore of clinical knowledge that Carlson and his collaborators should have been in a position to publish, in the present volume, an account of accurate and well-conceived observations made on man. The opportunity to do this presented itself when a young man having a permanent gastric fistula offered his services as an assistant in Carlson's laboratory. Starting with observations on the relationship between the movements of the stomach and the hunger sensations in this man, Carlson then extended the investigations to include observations upon normal and pathological individuals and upon animals under various experimental conditions. It was found that the normal empty stomach is continually undergoing changes in muscle tone, and that when these changes are pronounced, a dull sensation of hunger may be experienced. Actual hunger pains, however, occur only when periodic strong contractions become superimposed on the smaller tonic contractions. Similar hunger pains could be produced experimentally by causing the stomach to contract as a result of a sudden distension of the walls, thus indicating that the contractions serve as the adequate stimulus for afferent nerve terminations in the stomach walls.

The feeling of satiety following a full meal was found to be independent of the nerves of the gastric mucosa. This sensation is therefore partly psychic, as is also appetite. For example, a sensation of "coming appetite" could be set up by the introduction into the stomach, without excitation of the taste or olfactory nerves, of such substances as alcohol, mustard, pepper, etc. When thus introduced during a hunger period, the substances caused the sense of hunger to disappear and in its place one of anticipation of food, or appetite, to appear. Feeding is an instinct, its performance being prompted by the experience that the hunger pains can in this way be replaced by a sense of pleasure. The hungry babe thus puts everything to its mouth, and Carlson found that, if it be fed, the hunger contractions cease for some two or three hours and then set in again. The question is put as to whether this justifies the practice of some pediatricians of insisting upon long pauses between feeding.

A most interesting account is given of the subjective experiences felt by Carlson and one of his co-workers during a fast of five days.

Numerous experiments were also undertaken to determine the relationship of the nervous system to hunger, and the conditions under which hunger contractions occur, or by which they are inhibited.

The nature of the specific stimulus causing the hunger contractions, whether a hormone or stimuli initiated in the neuromuscular structures present in the stomach walls, is discussed.

Important observations were also made on the composition of the gastric juice, and the relationship of its acid content to various conditions.

We cannot too highly praise this splendid contribution to medical literature. Side by side with the works of Pavlov, Starling, and Cannon, Carlson's book should stand on the bookshelves of every student of digestion.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

THE PRACTICAL MEDICINE SERIES; COMPRISING TEN VOLUMES ON THE YEAR'S PROGRESS IN MEDICINE AND SURGERY. Under the general editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. X. NERVOUS AND MENTAL DISEASES. Edited by HUGH T. PATRICK, M.D., professor of neurology in the Chicago Polyclinic, and others. Series 1916. Publishers: The Year Book Publishers, 327 S. LaSalle Street, Chicago. Price, $1.35. Price of the series of ten volumes, $10.00.

A SURGEON IN KHAKI. By A. A. MARTIN, M.D., Ch.B., F.R.C.S., senior surgeon, Palmerston North Hospital, New Zealand. Popular edition, with illustrations. Publishers: Edward Arnold, 41 Maddox Street, London, W. Price 2/6 net.

TRANSACTIONS OF THE AMERICAN SURGICAL ASSOCIATION. Edited by JOHN F. BINNIE, M.D., recorder of the Association. Thirty-fourth volume. William J. Dorman, Philadelphia, 1916.

CATECHISM SERIES. SURGERY, Part I, and Part II, third editions; MATERIA MEDICA, Part I, and Part II, second editions; PHYSIOLOGY, Part I, third edition; PATHOLOGY, Part I, second edition. Publishers: E. & S. Livingstone, Edinburgh. Price 1/3 net per Part.

A MANUAL OF PHYSICAL DIAGNOSIS. By AUSTIN FLINT, M.D., LL.D., late professor of the principles and practice of medicine and of clinical medicine in Bellevue Hospital Medical College. Seventh Edition, revised by HENRY C. THACHER, M.S., M.D., associate in medicine in the College of Physicians and Surgeons of Columbia University. 372 pages with illustrations. Publishers: Lea & Febiger, Philadelphia and New York, 1917. Price $2.50.

CATARACT: Senile, Traumatic and Congenital. By W. A. FISHER, M.D., professor of ophthalmology, Chicago Eye, Ear, Nose, and Throat College. Published by, Chicago Eye, Ear, Nose, and Throat College, 1917. Price, $1.50.

EMERGENCY SURGERY. By JOHN W. SLUSS. A.M., M.D., F.A.C.S., associate professor of surgery, Indiana University School of Medicine. Fourth edition, revised and enlarged. 827 pages with 685 illustrations, some of which are printed in colours. Publishers: P. Blackiston's Son & Co., 1012 Walnut St., Philadelphia. Price, $4.00 net.

CLINICAL BACTERIOLOGY AND HÆMATOLOGY, for Practitioners. By W. D'ESTE EMERY, M.D., B.Sc., director of the laboratories and lecturer on pathology and bacteriology. Fifth edition, 303 pages. Publishers: H. K. Lewis, & Co., Ltd., 136 Gower Street, London, W.C., 1917.

THE JOURNAL OF UROLOGY (Experimental, Medical, Surgical). Edited by HUGH HAMPTON YOUNG. Volume I. Published bi-monthly by Williams & Wilkins Company, Baltimore. Price, $5.00.

PRACTICAL URANALYSIS. By B. G. R. WILLIAMS, M.D., director, Wabash Valley Research Laboratory. With illustrations. Publishers: C. V. Mosby Company, St. Louis, 1916. Price, $1.25.

Obituary

WILLIAM MORRISON MacKAY, M.D.

Dr. MacKay, whose death occurred at Edmonton, on the morning of February 25th, has been described as the doyen of the medical profession of the wast. He was one of the first practitioners to go out to the Mackenzie district in the days when the only settlements of white people were the training posts of the Hudson Bay Company. Born in Stirling, Scotland, in 1836, he was educated at Edinburgh and intended to became an engineer. An accident occurred, however, by which he lost the sight of an eye and during the time spent in the infirmary as a result of this, he determined to take up the profession of medicine. In 1858, he received the degree of M.D. from the University of Edinburgh. After practising for a few years, Dr. MacKay joined the Hudson Bay service and on June 13th, 1865, sailed from London for Canada. He landed at York Factory which at that time was inhabited by about sixty white people, and there he spent three years serving as doctor to the post. In the summer of 1868, he went to Fort Simpson in the Mackenzie district and from that centre he made many long excursions—in winter usually by dog sleigh—to minister to the Indians during the frequent outbreaks of infectious disease. The succeeding years were spent at various trading posts, first as doctor, then as doctor and trader, until in 1882 he was placed in charge of Fort Dunvegan, where he stayed for seven years. In 1889, he went to Fort Chipweyan and, ten years later, to Edmonton where he lived in retirement for nearly twenty years.

DR. NEWTON R. COLTER

The death of Dr. Colter occurred at Fredericton, New Brunswick, on April 7th, after an illness of only two days' duration. On Thursday, April 5th, Dr. Colter attended the funeral of his brother, Mr. James Colter, and was then apparently in good health; he contracted a cold, however, which quickly developed into pneumonia from which he succumbed early on Saturday morning. He was born in Sheffield, New Brunswick, in July, 1845, and was educated at Mount Allison University. From there he went to Harvard and to Queen's College, London, where he received his medical degree.

He practised for a time at Woodstock. In 1891, he entered the House of Commons as Liberal member for the County of Carleton, but was defeated by Mr. F. H. Hale at the next general election. In August, 1897, Dr. Colter was appointed post office inspector for the province of New Brunswick, a position which he held until April 1st, of this year, when he retired.

Dr. Garry Langstaff, who died at Thornhill, Ontario, on March 17th, was a well-known practitioner in York County. He was born at Thornhill in 1860 and practised in Brooklyn, New York, for about twenty-five years, returning to his native village a few years ago. Dr. Langstaff leaves a widow and infant daughter.

Dr. Jacob Zeilinski, who died at Toronto on March 22nd, was in the eightieth year of his age. He was a German by birth, and came to Canada in 1865. He practised at Maple, Kleinburg, and Toronto.

Dr. Charles A. Fisher, who died at Detroit, Michigan, on March 25th, was a son of Lieutenant-Colonel C. E. H. Fisher, of London, Ontario, and a graduate of the medical college of Western University. He was in the thirty-eighth year of his age and had been in practice at Detroit since 1902.

News

MARITIME PROVINCES

It was decided at a recent meeting of the Halifax City Council that the Board of Health should be empowered to draft by-laws to make overcrowding a criminal offence and to prevent landlords from collecting rent from occupants of premises declared by the board to be in an insanitary state.

ONTARIO

Dr. J. G. Wright has been appointed medical superintendent of the Kingston General Hospital. Dr. Wright was for some time on the staff of the Rockwood Hospital for the Insane.

Dr. J. D. Curtis, of St. Thomas, has been appointed to the surgical staff of the Workmen's Compensation Board, Toronto. Dr. Curtis served for a year in the Royal Army Corps, with the military rank of captain.

The plans have been prepared for the new St. Mary's Hospital which is to be built at Kitchener. It will consist of a main building of three storeys and a nurses' home for the Sisters, and, it is hoped, will be completed before the end of the present year.

Arrangements have been made to increase the accommodation in the Galt hospital by converting the present dining room into a children's ward. It is also proposed to provide additional accommodation for the nurses, probably by building another cottage.

The following is the list of cases of infectious and contagious disease reported in Ontario during the month of March: smallpox, 13 cases; scarlet fever, 260 cases, 6 deaths; diphtheria, 356 cases, 27 deaths; measles, 160 cases, 2 deaths; whooping cough, 112 cases, 4 deaths; typhoid fever, 40 cases, 9 deaths; tuberculosis, 182 cases, 109 deaths; cerebro-spinal meningitis, 15 cases, 10 deaths.

In the April Bulletin of the Toronto Department of Public Health, Dr. Hastings points out that infant mortality in Toronto has been reduced by more than 30 per cent. since 1914, when the Division of Infant and Child Hygiene was established; and that, whereas in 1910 the death rate among infants was as high as 139 per thousand, in 1916 it was only 91·5 per thousand births.

A bill was passed at the recent session of the provincial legislature, which provides for an increase in the municipal grant to hospitals. In future municipalities will pay $1.25 a day instead of the $1.00 previously contributed.

QUEBEC

During the past few weeks typhoid fever has been very prevalent in certain parts of the province, particularly in the towns on the banks of the Yamaska and Richelieu rivers. In Montreal, Lachine, Farnham, St. Johns, Iberville, St. Hyacinthe, Sorel, Levis, and Sherbrooke a number of cases have occurred, and at Sherbrooke, it is reported that the father, mother, and two sons of one family all died from the disease within a few weeks of each other.

MANITOBA

It is reported that an offer of a base hospital for service in France has been made to the government by the medical men of Winnipeg.

SASKATCHEWAN

The plans have been prepared for a new isolation hospital to be built at Saskatoon.

The contracts have been let for the sanatorium at Fort Qu'-Appelle and building has been commenced. It will be remembered that it was the intention to build the sanatorium in 1914 but the work was interrupted because of the war.

ALBERTA

In his report for the year 1916, Dr. Whitelaw, the medical officer of health at Edmonton, points out that tuberculosis is increasing in Edmonton and that although the number of deaths from this disease was thirty-five, only thirty-eight cases of tuberculosis were reported during the year. It is evident, therefore, that only a small percentage of the cases that occur are reported to the health authorities. The situation as far as typhoid fever is concerned is more encouraging, only eight cases of the disease being contracted in the city of Edmonton during the year; and of these eight, only one died. No cases of smallpox were reported. Referring to the cases of infantile paralysis, Dr. Whitelaw states: "Considerable public apprehension was caused by the appearance of anterior poliomyelitis here to a greater degree than ever before, though it never at any time became epidemic. It occurred in isolated districts of the city remote from one another, and no case seemed to be distinctly connected with the other so far as could be ascertained. No secondary cases occurred in any family affected, which suggests it is not of as highly infectious a nature as some of the ordinary infectious diseases. In all between July 15th and October 24th, thirteen cases developed, one of which came from the country. Of the thirteen cases, three died, two were left seriously crippled, four less seriously affected, and will eventually show slight evidence of the disease, and four recovered, after some weeks, almost completely the use of their limbs."

The classification of infectious diseases notified during the year was as follows: Measles, 1100; chicken-pox, 589; whooping cough, 130; scarlet fever, 44; diphtheria, 25; erysipelas, 36; tuberculosis, 14; German measles, 1; typhoid fever, 8; anterio poliomyelitis, 12; mumps, 11.

The population of Edmonton in 1916 is estimated at 53,794; the birth rate was 32·9, and the death rate 9·44 per thousand, the births numbering 1,700 and the deaths, 508. A slight decrease in infant mortality occurred as compared with previous years, and the number of deaths caused by infantile diarrhœa was only sixteen, which was due no doubt to the improved milk supply and the work of the Victorian Order nurse.

A number of cases of typhoid fever have occurred at Delia and, as a result, no visitors have been permitted to enter the town.

BRITISH COLUMBIA

During the year 1916, 645 patients were admitted to the Kootenay Lake General Hospital at Nelson, the average daily cost of maintenance being $1.67 for each patient.

MEDICAL COLLEGES

McGill University

Lieutenant Charles Burnsby Tinling, who died of wounds received in the battle of Vimy Ridge, was the son of Mr. C. W. Tinling of Montreal and was in his third year in medicine at McGill University when he enlisted with No. 3 General Hospital. While serving with this unit he rose to the rank of sergeant and subsequently was given a commission in the Canadian Infantry. He was wounded on two occasions. Lieutenant Tinling was born in Hamilton, Ontario, on March 30th, 1893, and graduated in Arts from McGill in 1914.

Lieutenant Lorne C. Montgomery, who is reported wounded for the second time, is a third-year medical student at McGill. In the spring of 1915 he enlisted with the McGill Military Hospital and after rising to the rank of sergeant, transferred to the 42nd Battalion. He was born at New Richmond, Quebec, in 1894 and has distinguished himself during his college career both as an athlete and a student of promise.

Queen's University.

A number of medical students who went overseas with the Queen's Military Hospital have returned to complete their studies. A special course commencing on May 15th, will be given for them this summer.

ARMY MEDICAL SERVICES

The following Canadian medical officers have been brought to the notice of the Secretary of State for War for valuable services rendered in connexion with the war:

Colonels: G. S. Rennie, J. W. Bridges, L. Drum, and W. A. Scott.

Lieutenant-Colonels: J. D. Brousseau, W. S. Buell, I. H. Cameron, G. Chambers, J. D. Courtenay, F. G. Finley, D. W. McPherson, F. H. Mewburn, and W. L. Watt.

Majors: I. D. M. Baxter, F. C. Bell, R. Bowie, D. A. Clarke, C. E. Doherty, L. E. W. Irving, A. W. Macpherson, J. C. Meakins, C. H. Reason, C. K. Russel, S. A. Smith, T. A. Starkey, R. Wilson, and C. A. Young.

Captains: M. H. Allen, A. W. Bagnall, C. A. Barager, B. M. Bayley, G. Boutheillier, F. B. Bowman, J. R. Goodall, G. C. Hale, A. J. Lomas, D. W. McGaffin, W. J. MacKenzie, H. C. Mercereau, E. A. Neff, H. Orr, R. W. Thomas, E. L. Warner, and J. H. Williamson.

Quartermasters and Honorary Captains: J. J. Cawthra and R. Kirkpatrick.

The list also includes the names of fifty-nine non-commissioned officers and men of the C.A.M.C.

Colonel Herbert A. Bruce, C.A.M.C., of Toronto, has been gazetted Colonel in the Royal Army Medical Corps.

The *Croix de Guerre* has been awarded by the Commander-in-Chief of the French Army to Captain Arthur C. Armstrong, M.D., of Alexander, Manitoba.

We are informed on the highest authority that the announcement which appeared in our April number (copied from the *London Gazette*) that Lieutenant-Colonel George E. Armstrong, of Montreal had relinquished his temporary commission in the Canadian Army Medical Corps, is quite incorrect.

PROMOTIONS in the C.A.M.C.: To be Surgeon-General: Colonel J. T. Fotheringham: To be Captain: Lieutenants B. F. Keillor and G. F. Bailey.

THE resignation of Colonel F. W. Marlow as A.D.M.S. of Military District No. 2 has been accepted by the Militia Department.

COLONEL GRAHAM CHAMBERS, C.A.M.C., officer commanding the Ontario Government Hospital at Orpington, is reported to be suffering from nervous breakdown.

LIEUTENANT-COLONEL T. P. BRADLEY, C.A.M.C., of Sarnia, Ontario, who went overseas as medical officer of the 149th battalion, is now second in command of the Convalescent Hospital at Buxton, in Derbyshire, England.

CAPTAIN C. A. PUBLOW, C.A.M.C., of Picton, Ontario, has been appointed adjutant of the Bramshott Military Hospital.

DR. W. T. CONNELL, professor of pathology, bacteriology, and sanitary science in Queen's University, has been appointed to the command of the new Queen's Military Hospital at Kingston, Ontario.

LIEUTENANT R. V. MCCARLEY, M.D., of Vancouver, has left for England to join the Royal Army Medical Corps.

DR. HYMAN LIGHTSONE, R.A.M.C., of Montreal, has been awarded the medal of honour by the French Government in recognition of services rendered in combating an epidemic of typhoid fever in the district of Querrien, Point Noyelles.

THE decoration of the Order of the White Eagle has been conferred upon Lieutenant-Colonel Gow by the King of Serbia. Lieutenant-Colonel Gow is attached to the University of Toronto Base Hospital.

CAPTAIN F. NICOLLE, C.A.M.C., of Toronto, has returned to Canada on account of ill health. Captains R. D. Rankin and R. H. Turnbull, of Toronto, have also resigned their commissions in the Canadian Army Medical Corps because of ill health.

Colonel A. E. Ross, C.A.M.C., M.P.P. for Kingston, Ontario, has been appointed Director of Medical Services with the Canadian Forces in France.

Lieutenant-Colonel A. Primrose, C.A.M.C., registrar of the medical faculty of Toronto University, has been gazetted consultant to the Canadian Expeditionary Force with the military rank of Colonel. A few months ago Colonel Primrose returned to Toronto from Salonica but has gone back to England again.

CASUALTIES

Died on Service

Major H. Jones, C.A.M.C.
Major D. B. Bentley, C.A.M.C., of Sarnia, Ontario.

Wounded

Captain W. Norman Gilmour, M.C., R.A.M.C., of Brockville, Ontario, medical officer of the 16th Royal Scots. Admitted to No. 7 Stationary Hospital, Boulogne, with a fractured right humerus.

Captain W. Norman Gilmour, M.D., South African Medical Corps, son of Mr. W. A. Gilmour of Brockville, Ontario.

Captain A. B. Chapman, C.A.M.C.

Canadian Literature

Original Contributions

La Clinique, January, 1917:

Du traitement des plaies de guerre du genou	Professor Berard.
La leucorrhée.	G. Juilly.

La Clinique, February, 1917:

Obstetrique pratique	G. Juilly.
Meningite syphilitique et meningite tuberculeuse chez l'adulte	L. Petit.

L'Union Médicale du Canada, January, 1917:

L'enseignement de l'hygiène dans nos pensionnats	Professor Dubé.
Contribution à l'étude de la tuberculine dans le traitement de la tuberculose	D. Masson.
L'héliotherapie	E. St. Jacques.
Honoraires des médecins—honoraires des experts	W. Derome.
La prohibition. Salut de la race	J. Gauvreau.
Végétations adenoides et leur influence sur les facultés intellectuelles des élèves	Dr. Malouf.

The Public Health Journal, January, 1917:

Principles involved in notification of tuberculosis	P. H. Bryce.
The sanitation of railway cars	T. R. Crowder.

Scientific Reports, Royal Victoria Hospital, Montreal, Series B, No. 1, 1916:

Nitrogen metabolism in pernicious anæmia before and after splenectomy	E. H. Mason and J. Kaufmann.
Nitrogen partition of the urine in trinitrotoluene poisoning; a preliminary note	V. J. Harding and E. H. Mason.
Observations on the Roth modification of the Plesch method of estimating the carbon dioxide tension of the alveolar air as an index of acidosis	Maude E. Abbott.
Pernicious anæmia, an analytical study	J. Kaufmann.
Tumours of the lung	R. A. Morison.
A case of benign leiomyoma of the œsophagus of unique size	J. Kaufmann and C. T. Crowdy.
On some hepatic abscesses, a clinical study	E. C. Smith.
Gastritis granulomatosa fibroplastica	G. E. Armstrong.
Ambulatory treatment of surgical tuberculosis with special reference to tuberculin	F. E. McKenty.
An unusually large external myoma of the stomach	W. W. Chipman and C. T. Crowdy.

Pyosalpinx complicating ectopic gestation.	J. R. Fraser.
The treatment of glaucoma by Elliott's operation	J. W. Stirling.
Tuberculous meningitis, with special reference to the tubercle of the choroid and its pathological manifestations . .	F. Tooke.
Facial paralysis associated with acute suppurative mastoiditis, cured by operation	D. H. Ballon.
Contributions to the pathological anatomy of the pancreas:	
1. On certain changes in the pancreas in diabetes mellitus and their possible relation to normal pancreatic evolution	H. Oertel.
2. Regressive and progressive changes in the pancreas, a contribution to post-natal organ evolution in its relation to disease	H. Oertel. and C. M. Anderson.
The origin of polypi of the gastro-intestinal tract, with special reference to acute inflammatory disturbances as one of the causes	H. Goldblatt.
An unusual, probably syphilitic splenomegaly	H. Oertel.
Two cases of rare tumour growths (Angioendotheliomata) showing unusual metastases	C. T. Crowdy.
Anatomic changes in trinitrotoluene poisoning, with special reference to the nature of the poisoning	H. Odland.

The Canadian Practitioner and Review, March, 1917.

The work of the Antitoxin Laboratory .	J. G. Fitzgerald.
Neuroses in returned soldiers	G. W. Howland.
Importance of housing and lodging house inspection	J. S. Schoales.

The Canadian Journal of Medicine and Surgery, March, 1917:

Arteriosclerosis	A. W. Holmes.

Dominion Medical Monthly, March, 1917:

Heat as a method of treatment in some forms of cavity carcinoma	J. F. Percy.
The vaginal douche	F. A. Harper.
The occurrence and treatment of pain in locomotor ataxia	E. L. Hunt.

The Canada Lancet, February, 1917:

Carriers of disease	Sir James Grant.
The relation of dyspnœa to acidosis	A. Hunter.
Notes on some cases of uterine fibroids with specimens	J. Milton Cotton.

The Public Health Journal, February, 1917:

Symposium on venereal disease:	
The medical aspect	A. McPhedran.
The public health aspect	C. J. Hastings.
The attitude of the hospital	C. K. Clark.
From the military point of view	Gordon Bates.
Discussion	H. B. Anderson.
The need for sanitary control and a minimum standard of house construction	F. Cartlidge.
Hours of work in relation to efficiency and output	J. W. S. McCullough.

The Canadian Journal of Medicine and Surgery, April, 1917:

Certain diseases of the skin in regard to the public health	D. King Smith.

Medical Societies

AMERICAN SECTION OF INTERNATIONAL ASSOCIATION OF MEDICAL MUSEUMS.—TENTH STATED MEETING

The American Section of this association held a highly successful meeting at the Academy of Medicine, New York, on April 5th, last. There was a large attendance of members representing the leading medical museums and laboratories of the United States and Canada. Twenty-one new members were admitted, and the following officers were elected for the ensuing year:

President, Dr. O. Klotz, Pittsburgh, Pa.
1st Vice-President, Dr. W M. L. Coplin, Philadelphia, Pa.
2nd Vice-President, Dr. H. E. Robertson, Minneapolis, Minn.
3rd Vice-President, Dr. A. S. Lamb, Washington, D.C.

Councillors: Dr. A. S. Warthin, Ann arbor, Mich.; Dr. W. M. L. Coplin, Philadelphia, Pa.; Dr. Howard Karsner, Cleveland, Ohio; Dr. M. C. Winternitz, Baltimore, Md.; Mr. R. A. Lambert, New York.

Secretary-Treasurer, Dr. Maude E. Abbott, Montreal.

Assistant Secretaries: Drs. Joseph Kaufmann and Louis Gross, Montreal.

The morning session was devoted chiefly to matters of business and the proceedings were attended by the liveliest interest. In his opening address, the president, Professor Oskar Klotz, of Pittsburgh, remarked upon the circumstances of national interest surrounding the occasion of this meeting in that the declaration of war had just been made and the thoughts of all were concentrated upon the needs of their country and upon the call that was being made to each to do his utmost in the public service. Dr. A. S. Warthin of Ann Arbor pointed out that this society—with other scientific societies—should at once place its services at the disposal of the American Government and moved a resolution that a message to this effect should be sent. The following telegram was accordingly despatched to Washington:

> "The American Section of the International Association of Medical Museums places itself on record as wishing to serve the American Government in the present emergency and offers the services of its workers and resources in its special field of Research in any way the National Committee may suggest."
>
> (Sgd.) Oskar Klotz, President.
>
> April 5th, 1917.

The subject of closer affiliation with the American Museums Association was brought up by Dr. Roy S. Miner of the U.S. National Museum, who attended as its official delegate and who carried formal instructions to do everything possible to promote closer relations between the two societies, and presented a cordial invitation to the American Section of the Medical Museums Association to send a delegate to the annual meeting on May 23rd next. On the motion of Dr. Coplin of Philadelphia, it was resolved that the kind invitation of the American Museums Association for a delegate to this meeting be accepted with thanks and the closer relationship of the two societies be established by the interchange of proceedings and by participation in the annual meetings of each through the attendance of delegates who shall have all the privileges of these meetings excepting only the right to vote. Dr. Maude Abbott, of McGill University was appointed delegate.

The establishment of a Central Bureau for the permanent preservation of the results of Scientific Research, especially histological material, for purposes of study by scientific workers throughout the country, a matter which had already occupied the attention of this society, in the years 1912–13, was brought forward by Dr. Winternitz, of Baltimore, and committee consisting of Drs. Winternitz, Leob, Haythorne, Karsner, Warthin, and the Secretary ex officio, was appointed to organize such a Central Bureau.

A discussion took place on the clashing of the time of meeting of the four societies now presenting programmes of kindred interest in the city, namely, the American Association of Pathologists and Bacteriologists, the American Section of the Medical Museums Association, the Cancer Society and the American Association of Immunologists. It was felt that in the common interest of all, some sort of federation should be attempted, so that subjects of common interest might be presented to combined audiences, and the president of this association was empowered to confer with the councils of the other societies to secure mutual coöperation upon the programme, place and time of meetings, with this end in view.

A report of a most successful character was presented by Dr. Klotz from the committee on the organization of a supply of square glass museum jars for the continent of America. Through the efforts of this committee, arrangements had been made with a Pittsburgh firm to manufacture these jars in ten standard sizes and a sample jar had been submitted by this firm of a satisfactory character, to be supplied at "duty free" prices to members of the Museums Association and scientific institutions, provided a sufficient number of orders were received before a given date. A circular letter to this effect, stating sizes, with prices, had been sent to all the members of the association and a sample jar submitted to a number of the largest institutions represented, and orders amounting to some $1,300 had already been received by the secretary.

In the discussion that followed upon this report, much praise was given to the success that had attended the action of the committee. The sample jar manufactured was pronounced quite as good and in some repects better than those which had been produced by the German firms and the prices offered were no higher. It was felt that the solution of a difficult problem had been practially reached, and a hearty vote of thanks was passed to the committee, and especially to Dr. Klotz, for the work accomplished in this connexion.

The necessity of obtaining increased orders, to meet the amount required by the firm before manufacture could be undertaken, was pointed out, and to this end it was recommended that this subject be brought before the American Museums Association and other leading scientific institutions, outside of the Medical Museums Association. It was decided that the transaction should remain between the Museums Associations and the manufacturing firm undertaking the work and that a commercial intermediary was not wanted for the present, and the secretary was instructed to send an announcement to the *Journal of the American Medical Association* inviting orders for square glass museum jars and offering to send statement of terms and a sample jar on request to intending buyers.

An interesting programme, published below, upon museum and laboratory technique, microscopic technique, museum teaching and presentation of results of medical research was presented. The exhibition of the association which was held in the Banquet Hall of the Academy of Medicine, remained open for three days for the benefit of the members of the Association of Pathologists and Bacteriologists and was largely attended.

PROGRAMME

MUSEUM AND LABORATORY TECHNIQUE

1. On the making of glass frames for mounting specimens in their correct anatomical relations, in square glass museum jars.—Mr. E. L. Judah, Montreal.

2. Elaterite as a seal for musuem jars.—Dr. J. J. Mackenzie, Toronto.

3. Use of celloidin for museum jars and Laboratory purposes. —Mr. Carl Kellner, Yale.

4. Methods of mounting animal parasites in solutions, including the use of plaster paris.—Dr. Fred. W. Weidman, Philadelphia.

5. Note on a modified sugar solution as a final preservative for

museum specimens (with exhibit of 12 specimens.)—Mr. E. B. Ellis, Hôpital Francais, New York.

6. Typewriting labels on museum jars.—Dr. C. V. Silvester, Princeton.

7. Some practical devices in the laboratory.—Dr. S. R. Haythorn, Pittsburgh.

8. Technique of obtaining samples of alveolar air with special reference to the Roth modification of the Plesch-Higgins method.—Dr. Maude E. Abbott, Montreal.

PRESENTATION OF RESULTS OF MEDICAL RESEARCH

9. Anthracosis associated with chronic tuberculosis.—Dr. O. Klotz, Pittsburgh.

10. Anthracosis associated with unresolved pneumonia.—Dr. S. R. Haythorn, Pittsburgh.

11. On the methods of organ reconstruction by injection of the arterial tree (with exhibit).—Dr. Louis Gross, Montreal. Discussed by Dr. M. C. Winternitz, Baltimore.

12. Syphilitic aneurysm of pulmonary artery with demonstration of the specimen.—Dr. A. S. Warthin, Ann Arbor.

13. Mesarteritis of pulmonary artery.—Drs. M. C. Winternitz and H. C. Schmeisser.

14. The persistence of cranial bone rudiments in complete acrania.—Dr. Carl Weller, Ann Arbor.

15. Uterus septus.—Drs. G. W. Phelan and Ralph Beech, Long Island College Hospital, Brooklyn, N.Y.

16. Incomplete transposition of vessels in a girl of sixteen.—Dr. J. W. McMeans, Pittsburgh.

MICROSCOPIC TECHNIQUE

17. Note on an American substitute for Russian paraffine.—Dr. A. S. Warthin, Ann Arbor.

MUSEUM TEACHING

18. Souchon Museum of Normal Anatomy.—Dr. E. Souchon, New Orleans.

SPECIAL EXHIBITS

19. Series showing (a) ossific centres by Schultz method, and (b) primary and secondary dentition by Spalteholtz Method.—Mr. Wm. Muir, McGill University, Montreal.

20. Series from the McGill Medical Museum and Royal Victoria Hospital, Drs. Horst Oertel, Maude Abbott and J. Kaufmann, and Mr. E. L. Judah.

21. Arteries of head and chest prepared by Souchon paint method.—Dr. E. Souchon, New Orleans.

MANITOBA MEDICAL ASSOCIATION

The annual meeting of the Manitoba Medical Association took place at Winnipeg on Thursday and Friday, February 8th and 9th, in conjunction with the annual meeting of the Winnipeg Medical Society. The meeting, which was well attended, was largely clinical in character and a number of interesting cases were presented. The presidential address was delivered by Dr. James McKenty of Winnipeg. Two papers by Dr. Frank Smithers, chief of the medical department of Augustana Hospital, Chicago, were of particular interest, the subjects being, "Modern conceptions in the diagnosis and treatment of pernicious anæmia," and "Diagnosis and treatment of gastric ulcer according to recently established clinical and laboratory facts." Other interesting papers were read by Dr. E. S. Bolton, of Brandon, on "Measles: the prevention of epidemics"; by Dr. J. A. Gorrell on "Hernia"; and by Drs. E. J. Washington and C. Robinson.

HALIFAX MEDICAL SOCIETY

The Halifax Medical Society held its fifth sessional meeting on March 14th, in the Institute of Pathology at the Victoria General Hospital. The president, Professor Fraser Harris, occupied the chair. Professor A. G. Nicholls, of the Chair of Pathology and Bacteriology, Dalhousie University, gave an interesting and instructive address on certain specimens illustrative of monsters. The specimens were all taken from the museum of the Department of Pathology. Several rare conditions were exhibited.

The sixth meeting of the Society was held on April 17th, in the rooms of the recently opened medical library of Dalhousie University. Professor Cameron, of the Chair of Anatomy, was in the chair. The chief communication was by Dr. J. G. Macdougall; it consisted in a survey of ten very instructive cases of surgical disease of the kidney. The Society received a report from the executive committee which had had an interview with representatives of the provincial government on the subject of the nonremuneration of medical services under the Workmen's Compensation Act. The executive committee also reported on having received a deputation from the Society of Registered Nurses of Nova Scotia relative to a register of unqualified nurses being kept quite distinct from that of nurses duly qualified.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. Murray MacLaren, C.M.G., St. John, N.B. President-elect—Dr. A. D. Blackader, Montreal. Secretary-treasurer—Dr. J. W. Scane, 836 University Street, Montreal.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. Herbert Bruce. Secretary—Dr. J. H. Elliot, 11 Spadina Road. Treasurer—Dr. W. A. Young.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. W. A. Lincoln, Calgary. Secretary-treasurer—Dr. D. G. Revell, University of Alberta, Edmonton South.
Annual Meeting, Calgary, 1917.

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett, A.M.C., Ottawa.

ASSOCIATION OF MEDICAL OFFICERS OF NOVA SCOTIA—President—Dr. George E. DeWitt, Wolfville. Secretary—Dr. W. W. Hattie, Halifax.

BRANT COUNTY MEDICAL SOCIETY:—President—Dr. E. R. Secord, Brantford. Secretary—Dr. M. N. Faris.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL SOCIETY:—President—Dr. J. L. Allen. Secretary—Dr. J. E. Aikenhead. Treasurer—Dr. W. Shipley.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Hon. J. W. Daniel, M.D., St. John Secretary—Dr. George D. Porter, Ottawa.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. N. E. Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. J. D. Pagé, Quebec. Secretary—Dr. J. G. Fitzgerald, University of Toronto.
Annual meeting, Ottawa, 1917.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

COLCHESTER-HANTS MEDICAL SOCIETY:—President—Dr. J. W. T. Patton, Truro. Secretary—Dr. H. V. Kent, Truro.

EDMONTON ACADEMY OF MEDICINE:—President—Dr. C. U. Holmes. Secretary-treasurer—Dr. E. L. Garner. Library, 12 Credit Foncier, Building.

ELGIN COUNTY MEDICAL ASSOCIATION:—President—Dr. G. A. Shannon, St. Thomas. Secretary-treasurer—Dr. W. F. Cornett, St. Thomas.

FRASER VALLEY MEDICAL SOCIETY:—President—Dr. DeWolfe Smith. Secretary—Dr. D. F. Carswell.

HALDIMAND COUNTY MEDICAL ASSOCIATION:—President—Dr. Hopkins Dunnville. Secretary—Dr. Courley, Cayuga, Ont.

HALIFAX MEDICAL ASSOCIATION:—President—Dr. D. Fraser Harris. Secretary—Dr. Hugh Schwartz.

Medical Societies—*Continued*

HAMILTON MEDICAL SOCIETY:—President—Dr. R. Y. Parry. Corresponding Secretary—Dr. Fred Harper. Treasurer—Dr. T. W. Blanchard.

HURON MEDICAL ASSOCIATION:—President—Dr. Machell. Secretary—Dr. Hunter, Goderich, Ont.

KINGSTON MEDICAL AND SURGICAL SOCIETY:—President—Dr. G. W. Mylks. Secretary—Dr. W. R. Connell. Treasurer—Dr. H. E. Day.

LAMBTON COUNTY MEDICAL ASSOCIATION:—President—Dr. J. E. Kidd, Wyoming. Secretary-treasurer—Dr. A. R. McMillan, Sarnia.

LEEDS AND GRENVILLE MEDICAL SOCIETY:—President—Dr. J. C. Mitchell, Brockville. Secretary-treasurer—Dr. F. S. Vrooman, Brockville.

LONDON MEDICAL ASSOCIATION:—President—Dr. E. Spence. Secretary-treasurer—Dr. C. A. Harris.

LUNENBURG-QUEEN'S MEDICAL SOCIETY:—President—Dr. J. W. Smith. Liverpool. Secretary—Dr. L. T. W. Penney, Lunenburg.

MANITOBA MEDICAL ASSOCIATION:—President—Dr. James McKenty, Winnipeg. Secretary—Dr. A. T. Mathers, Winnipeg. Treasurer—Dr. T. Glen Hamilton, Winnipeg.

MEDICAL OFFICERS OF HEALTH FOR COUNTIES OF LINCOLN AND WELLAND:—President—Dr. King, St. Catharines. Secretary-treasurer—Dr. Howell, Welland.

MEDICAL SOCIETY OF NOVA SCOTIA:—President—Professor Fraser Harris, Halifax. Secretary-treasurer—Dr. J. R. Corston, Halifax.

MEDICINE HAT MEDICAL SOCIETY:—President—Dr. W. H. Macdonald. Vice-President—Dr. C. E. Smyth. Secretary-treasurer—Dr. J. S. Macleod.

MONTREAL MEDICO-CHIRURGICAL SOCIETY:—President—Dr. W. S. Morrow. Secretary—Dr. Grant Campbell.

MOOSE JAW MEDICAL SOCIETY:—President—Dr. J. M. Hourigan. Secretary-treasurer—Dr. J. Bloomer.

NEW BRUNSWICK MEDICAL SOCIETY:—President—Dr. S. C. Murray, Albert. Secretary—Dr. F. J. Hogan, St. John. Treasurer—Dr. W. E. Gray, Milltown. Annual meeting, St. John, July, 1917.

NIAGARA DISTRICT MEDICAL ASSOCIATION:—President—Dr. E. T. Kellam, Niagara Falls. Secretary—Dr. G. M. Davis, Welland.

ONTARIO HEALTH OFFICERS' ASSOCIATION:—President—Dr. A. J. Macauley. Secretary—Dr. W. J. S. McCullough, Toronto.
Annual meeting, May 29th and 30th, 1917.

ONTARIO MEDICAL ASSOCIATION:—President—Dr. A. Dalton Smith, Mitchell. Treasurer—Dr. J. H. Elliott, Toronto. Secretary—Dr. F. A. Clarkson.
Annual meeting. Toronto, May 31st-June 2nd, 1917

OTTAWA MEDICAL SOCIETY:—President—Dr. Charles W. Gorrell. Secretary—Dr. A. MacLaren. Treasurer—Dr. Harold Alford.

OTTAWA MEDICO-CHIRURGICAL SOCIETY:—President—Dr. J. F. Argue. Secretary—Dr. R. K. Paterson. Treasurer—Dr. A. S. McElroy.

PERTH COUNTY MEDICAL ASSOCIATION:—President—Dr. A. D. Smith, Mitchell. Secretary-treasurer—Dr. F. J. R. Forster, Stratford, Ontario.

PETERBORO MEDICAL ASSOCIATION:—President—Dr. F. C. Neal. Secretary—Dr. E. A. Hammond. Treasurer—Dr. N. D. Buchanan.

PICTOU COUNTY MEDICAL ASSOCIATION:—President—Dr. C. S. Elliott, Stellarton. Secretary—Dr. John Bell, New Glasgow.

Medical Societies—*Continued*

PRINCE EDWARD ISLAND MEDICAL SOCIETY:—President—Dr. R. J. Macdonald, St. Peters. Secretary—Dr. Yeo, Charlottetown. Treasurer—Dr. W. J. MacMillan.

REGINA MEDICAL SOCIETY:—President—Dr. Gorrell. Secretary—Dr. Dakin.

ST. JOHN MEDICAL SOCIETY:—President—Dr. D. Malcolm. Secretary—Dr. F. P. Dunlop.

ST. THOMAS MEDICAL ASSOCIATION:—President—Dr. Alexander Turner. Secretary-treasurer—Dr. James A. Campbell.

SANITARY SERVICES OF THE PROVINCE OF QUEBEC:—President—Dr. A. Simard, Quebec. Secretary—Dr. J. A. Beaudouin, Lachine.
Annual meeting, 1917, Rimouski.

SASKATCHEWAN MEDICAL ASSOCIATION:—President—Dr. R. H. Love, Saskatoon. Secretary—Dr. J. W. Turnbull, Regina.
Annual meeting, Saskatoon, July, 1917.

SASKATOON MEDICAL ASSOCIATION:—President—Dr. T. W. Walker. Secretary—Dr. J. T. Mackay.

SIMCOE COUNTY MEDICAL ASSOCIATION:—President—Dr. Spohn, Penetanguishene. Secretary-treasurer—Dr. H. T. Arnall, Barrie.

SOCIÉTÉ MEDICALE DE MONTRÉAL:—President—M. B. G. Nourgeois, Secretary—H. M. Aubry, 323 Sherbrooke Street East, Montreal.

SOCIÉTÉ MÉDICALE DU DISTRICT D'OTTAWA:—President—Dr. M. Aubry. Secretary—Dr. M. J. E. D'Amour, Papineauville.

SOCIETE MEDICALE DE QUEBEC:—President—Dr. M. Savard. Secretary—Dr. M. Couillard, Quebec.

SOCIÉTÉ MÉDICALE DE TROIS-RIVIÈRES:—President—Dr. M. Deblois. Secretary—Dr. O. Darche.

SWIFT CURRENT DISTRICT MEDICAL ASSOCIATION:—President—Dr. Graham. Secretary-treasurer—Dr. Hughes.

THUNDER BAY MEDICAL SOCIETY:—President—Dr. E. B. Oliver, Fort William. Secretary-treasurer—Dr. J. G. Hunt, Port Arthur.

TWIN CITY MEDICAL ASSOCIATION:—President—Dr. W. L. Hilliard. Secretary—Dr. J. E. Hett, Berlin, Ont. Assistant Secretary—Dr. G. E. Chapman.

VALLEY MEDICAL SOCIETY:—President—Dr. M. E. Armstrong, Bridgetown. Secretary—Dr. T. M. MacKinnon, Berwick, N.S.

VANCOUVER MEDICAL ASSOCIATION:—President—Dr. J. H. McDermott. Secretary—Dr. J. W. Ford. Annual meeting, April, 1917.

WEST ELGIN MEDICAL SOCIETY:—President—Dr. D. A. Cameron, Dutton. Secretary-treasurer—Dr. D. J. Galbraith, Dutton.

WINNIPEG MEDICAL SOCIETY:—President—Dr. Jasper Halpenny. Secretary—Dr. Secord.

The Canadian
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DIABETES ASSOCIATED WITH HÆMOCHROMATOSIS

By A. H. McCreery

Late R. B. Mellon Fellow in Pathology, Pittsburgh, Pa.

TROUSSEAU early in the eighteenth century referred in his clinical lectures to an autopsy upon a diabetic having a bronzing of the face, an almost black discolouration of the penis, and a greatly enlarged and cirrhotic liver. Troisier in 1871 described a similar case under the name "Diabète sucre". Hanot and Chauffard in 1882 and Hanot with Schachman in 1886 have been given the credit by most authors for first describing the disease in their reports of two cases and naming the condition "Diabète bronzé". They believed that the diabetes was the primary manifestation and that subsequently the liver cells were stimulated to an increased production of pigment.

Many authors have since commented upon the subject, and different views have been advanced. The discussions have centered about the questions pertaining to the sequence of events in the disease. One of the important points considered was whether there were two somewhat similar bronzing diseases, one associated with cirrhosis of the liver and the other with diabetes mellitus. Much has been learned of the nature of the process in each by the many clincial and pathological studies. The pathological processes leading to a deposit of iron-containing pigment in organs, many times greater than that normally found, has been an especially difficult problem for solution, partly because the blood in which one would expect to find signs of red blood cell destruction, indicates no more than a slight anæmia.

From the Pathological Laboratories, University of Pittsburgh.
Received for publication, March 22nd, 1917.

A review of the literature concerning iron-pigment deposits, a discussion of the hypotheses of the many authors and the hope of suggesting some new ideas on the subject (besides the fact that this is but the ninth case reported in the United States), is sufficient reason for bringing forward this report.

I think it can be fairly established that there are three cardinal features of the advanced cases, namely, pigmentation of the viscera and usually of the skin, cirrhosis of the liver of a portal or atrophic type, and diabetes mellitus which dominates the clinical picture of the later stages. These clinical and pathological features constitute "bronzed diabetes".

Simple hæmochromatosis without diabetes has been described a number of times (13, Potter and Milne) and it is interesting to note that in cases so described, cirrhosis of liver and other organs were also present. A minor type of hæmochromatosis has likewise been observed in a variety of diseases in which, however, the evidence of a primary blood destruction was an outstanding feature. Some of the reported cases of simple primary hæmochromatosis show that the cause of death was occasioned by an intercurrent disease, such as typhoid fever (Opie), and tuberculous peritonitis (Sprunt). It is, therefore, possible that the fatal complication prevented the development of the typical picture of bronzed diabetes before death. However, according to the observations by Anschutz on six cases of bronzed diabetes, it has been shown that glycosuria may be a very variable sign disappearing for certain periods during the disease. Letulle reported a case in which the glycosuria was absent for two months and then reappeared. Other authors have likewise noted a varying glycosuria during treatment or just before death.

I am indebted to Drs. Nettleton and Mercur for the clinical data and for permission to report the following case.

Case History: Mr. W. M. D., aged forty-six, plumber by occupation.

Family History: Father died at the age of seventy-one of cancer of the tongue; mother died at the age of eighty-one of cerebral apoplexy. Three brothers are living and well. One brother died at the age of twenty-seven, the cause of death being unknown. Two sisters are living and well.

Personal History: He has had the usual diseases of childhood. He was a heavy drinker from about 1890 to 1900, but since 1900 he has had periods of total abstinence with an occasional spree at which time he drank large amounts of whiskey. He has suffered a good deal from digestive disturbances and first came under observation in 1902 for the relief of indigestion. He complained at that time of eructation of gas and food and of feeling tired and listless. He slept well but was tired on awakening. During this illness, he lost eighteen pounds in six months. At this time he had pain and tenderness in the epigastrium. Subsequently for a number of years he suffered from gastric and intestinal indigestion. Attacks of "grippe" were frequent, yearly from

1890 until 1897, and sometimes twice a year. He also had various so-called rheumatic affections and lumbago. In 1896 he suffered an attack of gout. In 1902, until August, 1913, he had many recurrences of hyperchlorhydria.

From the time he came under observation he was never robust. His appearance was that of a prematurely old man, his hair having turned quite gray, which, however, was a family characteristic.

Present Illness: From the time he came under observation there was no indication of renal or liver disturbance until 1912, when the urine showed a few hyaline casts and a fairly well marked reaction for indican. The specific gravity was 1025. The indican cleared up after several weeks.

In July, 1913, there was a large amount of indican, which disappeared after a prolonged treatment and rest. On August 22nd, when at least semi-weekly examinations were being made, the first appearance of glycosuria was noted. This glycosuria soon became excessive, and in December he had become bed-ridden. From the time he was bed-ridden until his death, almost daily estimations of the total percentage of sugar were made by Benedict's method. Urea was also estimated from time to time.

SUGAR ESTIMATIONS

August 22, 1913	Trace.
" 23, "	No Sugar.
" 25, "	Slight.
" 26, "	Slight.

Dr. Nettleton was out of town for a period and records were not kept of the amounts of sugar found.

December 15, 1913	3·0%	December 28, 1913	2·9%
" 16, "	4·6	" 29, "	2·7
" 17, "	4·5	" 30, "	0·2
" 18, "	3·10	" 31, "	0·3
" 19, "	3·18	January 1, 1914	0·5
" 20, "	1·9	" 2, "	2·3
" 21, "	2·2	" 3, "	7·0
" 22, "	2·1	" 4, "	1·0
" 23, "	3·1	" 5, "	2·0
" 24, "	3·1	" 6, "	2·4
" 25, "	2·9	" 7, "	2·8
" 26, "	2·6	" 8, "	2·8
" 27, "	2·8	" 9, "	0·2

At no time during the course of the diabetes mellitus was the urine sugar free, the nearest approach was on December 30th when the patient had a "green day" with much nausea and vomiting. From December 15th, the patient was on strict carbohydrate free diet.

The total quantity of urine varied from 2150–4200 c.c. until January 8th, when there was almost complete suppression until death on January 12th. Acetone and diacetic acid were present in very large quantities and were constantly observed from the early part of December. Ammonia was estimated. The minimal total was recorded on December 21st at 3·029 grammes and the maximum on January 3rd at 5·0 grammes.

The patient was poorly nourished and became greatly emaciated. At no time during the course of this disease was an enlarged liver observed and the spleen was never palpable nor enlarged on percussion. There was tenderness over the liver and in the epigastrium.

The following autopsy report is taken from the records of Professor Oskar Klotz, to whom I desire to express my thanks for the assistance rendered me during the course of the work.

AUTOPSY

The body was that of a thin and much emaciated man appearing considerably older than the stated age. The skin surfaces were quite pale and rather yellow. Post-mortem rigidity was present and there was some lividity of the dependent parts. The hair was quite white, the eyes were sunken and the tissue over the cheek bones was sparse. The neck was long and thin, and the supraclavicular fossæ were quite deep. The chest was long and narrow, while the antero-posterior diameter was shallow. The abdomen was flat. There was no evidence of œdema of any of the tissues.

Thorax: The thoracic cavities were quite clear. There was no excess fluid in either cavity and neither lung presented any adhesions. The pleural surfaces were clear, shiny, and quite pale.

Lungs: Both lungs crepitated in all their parts. The lung tissue was quite soft and there was no evidence of consolidation in any portion. Foci of tuberculosis were not evident. There was a little hypostatic congestion along the posterior border of the right lower lobe. There was relatively little anthracosis in the lung tissue. Some of the lobules were bordered by lines of black pigment.

Heart: The pericardial sac contained a small quantity of clear yellow fluid. The pericardial surfaces were clear and shiny. The heart was very flabby and moulded itself in various positions when placed upon a flat surface. Both ventricles were in partial diastole. Partially coagulated blood was present in all cavities. The heart was rather globular in shape, the apex being rounded and being formed by the lateral border of the left ventricle. The tip of the left ventricle appeared to be drawn upwards on the right side. The epicardium contained a fair amount of bright yellow fat. The heart valves were fairly normal save that there was a slight thickening of the free border of the tricuspid valve as well as some thickening of the insertion of the aortic valves. The valve leaflets, however, were free and apparently competent. There were a few fatty spots upon the posterior surfaces of the free mitral cusp. The heart muscle was light in colour and of a yellowish red appearance. The muscle tissue of all parts was extremely flabby and quite easily broken. The cut muscle was rather mottled and showed some distinct yellow areas on the cut surfaces. Some of the papillary muscles of the left ventricle showed a distinct thrush breast mottling. The coronary arteries showed some yellow plaques irregularly distributed along the main vessels. This was more prominent in the coronary. The muscle of the ventricle appeared thinner than normal and the cavity of the left ventricle was enlarged. The foramen ovale was closed.

Aorta: The base of the aorta was quite thin and elastic and showed a few fatty streaks just above the aortic ring. The aortic wall showed no sclerosis. It was observed, however, that the larger vessels arising from the abdominal aorta, and particularly the superior mesenteric and splenic artery showed considerable sclerosis and rigidity of their walls.

Abdomen: On opening the abdomen very little fat was found over the abdominal parietes. This fat was quite lobulated and of a rather dark yellow appearance. The abdominal muscles were thin and appeared atrophied. The peritoneal surfaces were all clear and there was no excess fluid in the abdomen. The coils of the small intestine were free and only slightly distended with gas. There were no peritoneal adhesions. The great omentum was very thin and contained a little fat. The transverse colon was distended with gas and formed a large V-shaped loop whose lower border reached 4 cm. below the umbilicus. The liver projected 5 cm. beyond the tip of the xyphoid but the border did not extend below the costal margin on the right side. There were no adhesions in the vicinity of the liver. The diaphragm arched to the fifth rib in the right nipple line and to the sixth rib in the left nipple line. In the vicinity of the duodenum there were no adhesions or any evidence of an abnormal process. The stomach was quite free in its position.

Stomach and Intestines: Nothing of particular note was observed in connexion with the gastro-intestinal canal. Evidence of inflammation or bands of adhesions were wanting. The bile papillæ in the duodenum appeared normal and quite patent. There was no pathological process associated with the ampulla of Vater. The appendix showed some constriction and fibrosis in its upper one-third with slight dilation in the middle third in which an enterolith was found. There were no adhesions about the appendix.

Liver: The organ was above normal size. Both lobes were well devoloped, the left appearing larger than usual. The capsule of the liver was quite thin and transparent. Along the lower border of the left lobe the surface of the liver was rather granular. There were two vertical grooves extending over the dome of the right lobe for a distance of about 12 cm. These grooves were parallel. The liver substance was brown in colour and did not have the usual red or reddish gray appearance of liver tissue. The colour resembled that of iron rust. The cut surface of the liver was quite granular and although the liver lobules were not distinct, the markings of the portal system were more prominent on account of a glassy fibrous tissue outlining them. The liver tissue was quite firm and was not readily broken. When cut with a knife the tissue appeared tough, and the cut surface was a bright brown and quite granular. The bile channels within the liver showed nothing of note. The gall bladder contained a rather dark bile but its walls were thin and normal. The bile ducts extending to the duodenum were healthy and evidence of stone, inflammation, or tumour was wanting.

Pancreas: Measured 17 x 4 x 3 cm. The pancreas was carefully dissected out with a portion of the duodenum attached. The pancreas was of good size and showed no evidence of atrophy in the gross specimen. Over the surface of the pancreas there were seen a number of small pinhead-sized white spots, which, on close examination, were found to be fat necroses. Several of these spots were also seen within the organ. The tissue surrounding the pancreas appeared quite normal. The pancreas was quite firm and on section the lobules were unusually distinct. The lobules were separated by definite and prominent fibrous tissue trabeculæ. This fibrosis was diffuse and not isolated to any particular region of the organ. The colour of the pancreas was striking and resembled that previously noted in the liver. It was of a decided bright brown or rusty character. The pancreatic ducts were not dilated and there was no evidence of obstruction or other pathological change in these passages. Some of the lymph glands in the vicinity of the pancreas were slightly pigmented while other lymph glands found near the head of the pancreas showed a very decided rusty colour. The glands though a little enlarged, showed no macroscopic evidence of fibrosis.

Spleen: The spleen was about normal in size. The capsule was thin and somewhat wrinkled. The tissue felt rather flabby and on section the organ was quite dark with occasional rusty areas. The Malpighian bodies were visible, the pulp substance was not easily broken and there was no evidence of definite fibrosis to the naked eye.

Left Kidney: The kidney was considerably larger than normal. The posterior border was rounded and of a hog-back character. The capsule was quite thin and peeled easily. The outer surface of the kidney was very pale, and rather grayish white. On section the cortex and medulla were sharply demarcated. The cortex was quite wide and of light colour and showed a rather granular appearance with streakings of red and gray. Many of the glomeruli were visible as congested dots. The pelvis and ureter were without change.

Right Kidney: The organ was similar to that of the left showing general enlargement and the light colour of the cortex. The cortex appeared wider than usual and showed similar streakings as in the left.

Adrenals: Both adrenals were of normal size. The cortex was thin and of a bright yellow colour. The medulla was soft and dark. In the medulla the tissue had a rather rusty brown apearance. The medulla was so soft that it was readily broken during removal.

Thyroid Gland: The thyroid was small, both lobes being smaller than normal. The tissue was of a dark meaty character and showed relatively little colloid. There was no evidence of fibrosis.

Anatomical Diagnosis: (Bronzed diabetes): fibrosis of pancreas; fat necrosis of pancreas; hæmochromatosis of liver, pancreas, heart, spleen, adrenal, thyroid and lymph glands, fatty degeneration of heart; brown atrophy of heart; dilatation of heart (right and left ventricles); peripheral arteriocslerosis; portal cirrhosis of liver; chronic parenchymatous nephritis.

A brief review of the outstanding points in the case both from the clinical and pathological side would indicate the following conditions. The patient was an adult male forty-six years of age; he was a plumber by occupation, and had been a heavy whiskey drinker. From 1902 until his death he suffered many gastro-intestinal disturbances and loss of weight. There was pain and tenderness in the epigastrium, but the liver was not obviously enlarged. The spleen was not palpable. The patient yearly suffered attacks of grippe and had numerous attacks of neuralgia, rheumatism, and lumbago. On August 22nd, 1913, there was found a trace of sugar in the urine which soon became excessive and the patient rapidly weakened. Acetone and diacetic acid were found in December, 1913, and the patient died in semi-coma with a terminal decrease in percentage of sugar and almost suppression of urine on January 12th, 1914. At no time was the urine sugar free. At autopsy there was found hæmochromatosis of liver, heart, spleen, adrenal, thyroid and lymph glands; portal cirrhosis of liver and fibrosis and fat necrosis of the pancreas. The pathological findings, therefore, were typical of the so-called bronzed diabetes.

Portions of different organs were fixed in Zenker's solution and in formalin for microscopical study. Microscopic sections were by the paraffine method and stained with eosin and methylene blue, hæmatoxylin and eosin Van Gieson's method and by lithium carmine and picric acid. Other special connective tissue stains were used. For iron pigment, we found that Perl's method was quite unsatisfactory. Nishimura's modification of Perl's method was substituted and our results show that this procedure is much superior for the demonstration of iron in tissues. Briefly Nishimura's test for iron pigment is as follows: formalin fixed sections are immersed in a strong solution of ammonium sulphide for one hour. Washed thoroughly in distilled water. The sections are then placed in a mixture of 2 per cent. potassium ferrocyanide and 1 per cent. hydrochloric acid for twenty minutes. Finally place the sections in 0·5 per cent. hydrochloric acid until blue (twenty minutes to one hour). Wash in water. Counterstain with hæmatoxylin and eosin or lithium carmine differentiated by picric acid and mount in balsam.

MICROSCOPICAL

Liver: The sections of the liver showed the well preserved lobules or aggregations of lobules distinctly defined by an excess amount of connective tissue in the periphery. However, a very striking feature was the presence of a large quantity of golden yellow pigment, as fine granules or in coarse masses in all portions of the liver. This pigment was present within the lobules and was found within the liver cells as well as in the interstitial tissue. The amount of pigment within the liver cells varied from a fine sprinkling of a few small yellow granules to a crowded condition in which the substance of the cell could not be recognized. However, there appeared to be a tendency to a peripheral arrangement of the pigment in the cell. The lining cells of the bile capillaries and large bile ducts also contained the pigment.

The interstitial tissue of the portal systems was markedly increased. The greatest amount of pigment was in the periphery of the lobules in the area occupied by the portal cirrhosis. In so far as the liver parenchyma itself was concerned there was more pigment in the central portion of the lobule than in the peripheral parts. In the sinusoids a little free pigment was noted. Kupffer's cells were well filled with pigment granules. One would be led to infer that a part, at least, of the pigment present in the fibrous tissues of the portal areas had accumulated as a result of the death of some of the liver cells. In the muscle fibres of the walls of the blood vessels, in the endothelial cells of the vessels and of the perivascular lymph spaces a moderate amount of pigment was demonstrated.

Throughout the section the central portion of the liver lobule showed an adenomatous hyperplasia. These areas were small, round, and contained but a slight amount of pigment.

Sections stained with sudan showed only occasional fat droplets within the liver cells. There was no evidence of a fatty degeneration. Nishimura modification of Perl's test showed a prussian blue colour in the pigment throughout the section.

The areas of fibrosis showed a mature connective tissue with but slight progressive reaction in which lymphocytes were found. The fibrosis was distributed in a manner parallel to the direction of the vessels in the portal system. In part, it appeared that the deposit of pigment in these areas was within lymphatic spaces and at times within spindle-shaped fibroblastic cells. The fibrosis was not arranged concentrically about the pigment masses. Many pseudobile ducts were noted within this new connective tissue.

Pancreas; The lobules of the pancreas were well retained and separated from each other by strands of connective tissue, which, in places, was in excess. It cannot be said, however, that the excess of fibrous tissue was particularly of an interlobular type. More marked evidences of fibrosis were present within the lobules. There was no lymphatic infiltration in the fibrosed areas. In these situations curious patches of connective tissue occupied each lobule and pervaded the surrounding tissues in a stellate manner. These areas of fibrosis were also the site of an accumulation of a rusty yellow pigment. This pigment was found within the glandular cells of the neighboring alveoli as well as in the clefts of the mature connective tissue. Nearly every secreting cell of the pancreas contained pigment in varying amounts, more marked in the periphery of the lobule.

The pancreatic ducts showed no evidence of dilatation. It was noted that the epithelial lining of these structures was for the most part wanting or present in accumulated debris. These cells were not pigmented.

The islands of Langerhans were almost entirely obliterated. A few partially preserved islands were found. The majority of them were involved in fibrosis showing much capsular thickening and some hyaline change of the fibrous tissue. There was some pigmentation of the islands.

Several areas of fat necrosis were found in frozen sections. These areas were quite apart from the tissue involved in fibrosis or pigment deposit. A slight infiltration by lymphoid cells was seen about some of these areas of necrosis.

Lymph Gland: (Near Head of Pancreas): This gland showed quite a remarkable appearance. The whole structure with its capsule was permeated by a rusty yellow pigment which was deposited in coarse granules of irregular shape. Some of the larger pigment masses showed a granular centre with a homogeneous laminated outer structure. The pigment was present within some endothelial cells, but for the most part, it appeared to lie in the clefts of a new formed connective tissue.

The gland had lost its normal architecture and the lymph follicles had disappeared. In their place a connective tissue permeated the entire structure. The older areas of fibrosis were of a hyaline character. The lymph sinuses were quite patent and contained cells filled with pigment. On the other hand, the large lymph channels showed the presence of precipitated albumen while free pigment and pigmented cells were entirely wanting in them.

Rather curious structures were found in various portions of the lymph glands. These consisted of jointed strands showing branches and looking not unlike coarse mycelial threads of some moulds. These structures did not stain well with hæmatoxylin, and were Gram negative. Commonly they were grouped together and fibrosis was usually evident in their vicinity.

Sections of the lymph gland when treated with Nishimura's method gave a marked iron reaction. The mycelial like strands also took on the prussian blue colour.

Intestine: (*Duodenum*): Sections of the duodenum showed a normal looking structure. There was no evidence of inflammation. In the mucosal folds a slight amount of a yellowish iron-containing pigment was seen in the interstitial tissue. The epithelial cells did not contain pigment, nor was there any of it present in the deeper structures of the bowel wall.

Heart: The heart muscle was very pale and the fibres were quite narrow. Fragmentation and segmentation of the muscle fibres were evident in all portions of the tissue examined. There was no evidence of an inflammatory reaction or of old fibrosis. The arteries in the muscle tissue showed slight sclerosis. On the other hand, the muscle fibres were loaded with a brown pigment which had accumulated within their substance. This pigment was well retained even after alcohol treatment. This pigment was particularly evident in the vicinity of the nuclei and was arranged in a peculiar wedge-shaped manner towards the ends of the fibres.

Besides this another form of pigment was present in the myocardium. This was observed in the interstitial tissue between the muscle fibres. In the vicinity of the small arterioles a number of oval perithelial cells were not uncommonly seen containing much of this pigment. The pigment was much coarser and darker than that within the muscle fibres. With the test for iron, two pigments were demonstrated. One gave a positive reaction, the other was negative. The latter was deposited in the muscle fibres and corresponded to the nature and distribution of the pigment of the brown atrophy. All of the remaining pigment both within the muscle as well as in the interstitial tissue was iron-containing.

Adenal: The adrenal cortex contained very little fat. The inner zone of the cortex stained poorly and the arrangement of the cells was not as regular as usually found. The pigmented zone of the medulla was well marked. There was no evidence of an inflammatory infiltration. In the outer zone of the cortex, close beneath the capsule were found a number of patches of pigment deposit. These consisted of a brownish yellow coarse and granular pigment. The deposits were within the cells of the adrenal columns. In some places an excess amount of fibrous tissue invaded the cortex from the capsule. The pigment deposit in the outer portion of the cortex was quite distinct from the pigmented cells of the medulla. The iron reaction showed all of the pigment, except that in the medulla, to be iron-containing.

Thyroid: The section of the thyroid showed a rather congested tissue in which the alveolar spaces were small. For the most part, the alveoli consisted of small gland-like structures devoid of lumina. Colloid was present only in slight amounts. The alveoli were not enlarged, and it was only seldom that the epithelial lining was thrown into folds. The epithelial cells were, for the most part, cubical. Many of the alveoli contained a fine pink-staining granular material.

An interesting feature was the presence of a granular yellow pigment similar to that previously described, which was present in the epithelial cells lining the alveoli. In the interstitial tissue which was slightly increased in amount there was moderate pigmentation. The pigment lay in fibrous tissue cells. Again some slight pigmentation was noted in the endothelial cells lining the perivascular lymph spaces. Free pigment in the alveoli was only occasionally seen. There were, however, a few masses of desquamated epithelial cells with pigment lying in the lumina of the glands. This pigment gave a positive iron reaction.

Spleen: The Malpighian bodies were well defined. The central arteries showed some hyaline degeneration of their walls. The pulp substance was quite congested and in the walls of the sinuses were irregular deposits of pigment which had been phagocyted by the large endothelial cells. There was some evidence of fibrosis, but it did not appear that the tissues of this organ were particularly active in the process of regeneration or destruction of red blood cells. In the trabeculæ there were some iron deposits, the pigment being held in connective tissue cells. Likewise some granules of pigment were noted in the muscle cells of the large vessels. The pigment gave a positive iron reaction.

Kidney: There was considerable change in the cortex of the kidney. For the most part, this change was in the parenchymatous portion, there being little or no reaction in the interstitial tissue. The glomeruli were large and their capsules widely dilated, with, in many instances, a vacant space between them and the glomerulous. The glomerular capsule was not thickened. The convoluted tubules were large, the epithelium stained poorly, and the individual cells were of irregular size and shape. Many of these tubules contained a debris. A number of loops of Henle were found to contain a slight amount of yellow granular pigment. The amount of this pigment was relatively small. It was absent from the convoluted tubules and from the glomeruli. The sudan stained specimens showed an unusual amount of a fatty degeneration of all the tubules of the cortex. Likewise a considerable amount of fat was present in the collecting tubules of the medulla. In the cortex the fat was present at the base of the epithelial cells and appeared in small clusters of yellow globules. The stained tubules were sharply outlined by the amount of fat present in the peripheral portion.

The diabetes in the case reported was of very severe character, the process lasting from August 22nd, 1913, to January 12th, 1914. It was associated with the fibrosis of the pancreas and islands of Langerhans. The fibrosis in the liver and elsewhere could not have resulted in such a short period as indicated by the diabetes. Acetone and diacetic acid appeared early in the diabetes and the patient died in mild coma. Death in other cases usually occurred within a year or very little over.

From the literature of this very interesting pathological process, one can classify the views of the different authors on the etiology of bronzed diabetes into five large groups. (1) Many regard a primary blood destruction as the cardinal factor in the production of pigmentation and fibrosis; (2) another group of observers take the opposite point of view and lay no stress upon changes going on in the blood, but believe that there is a retention of the normal pigments; (3) others lay stress upon the abnormal metabolism of the cells, (a) disturbed chromogenic metabolism, (b) autolysis of liver cells; (4) some regard the condition as a form of diabetes mellitus in which the pigmentation is an incidental and secondary occurrence; and (5) many workers believe that there may be a concomitant pigmentation and cirrhosis of the pancreas. These we will discuss in order.

Primary blood destruction or intravascular alteration of hæmoglobin with the production of pigment deposits as the basis for the sequence of events in the disease was first discussed by von Recklinghausen in 1889. He described hæmofuscin as a pale yellow non-iron-containing pigment in smooth muscle cells of stomach, intestine, blood vessels and lymphatics, and occasionally in the bladder, ureter and vas deferens. He also noted it in the connective tissue cells of Glisson's capsule, splenic trabeculæ, adrenal and the sheaths of blood vessels. In the twelve cases studied by von Recklinghausen a local and general pigmentation of the organs were observed. To this pathological condition he gave the name, hæmochromatosis. He claimed that the pigment was derived from the blood.

Processes of active blood destruction have been found in the majority of the cases of hæmochromatosis. Hæmorrhage was noted in some. Purpura was reported in four cases by Opie and recurrent purpura was observed in a case by Anschutz. Hindenlang described a case associated with morbus masulous Werlhoffi. Hintz reported two cases having hæmorrhagic pericarditis and peritonitis and one case with subcutaneous hæmorrhages. Quincke and Tillmans have reported large extravasations of blood in various tissues. Buss reported cases with hæmorrhagic pleurisy, peritonitis and pachymeningitis. Abbott and Hintz have noted chronic intestinal disease. Potter and Milne observed the presence of tuberculosis and sepsis. Sprunt had two cases with a history of dysentery. Malaria has been noted by Osler and Rolleston. Skin lesions with focal hæmorrhages have also been frequently described. Futcher had one case having a papulo-squamous eruption over the legs and one with a red eruption over the chest a week before death. Osler noted purpura and urticaria over the legs in one case and erythma nodosum in the other. Parker's case had a chronic varicose ulceration of the leg.

Anæmia was described in a case showing widespread pigmentation in the liver, spleen, and pancreas by Quincke. However, this is the only case in which a true anæmia has been described. Sprunt says in his cases the average of four counts in three cases was 4,709,000 red cells and hæmoglobin of 90 per cent. Jeanselme reported a count of 3,379,000 and later 3,308,000 red cells shortly before death, but did not see any nucleated cells. Futcher in two cases reported counts of 4,800,000 and 5,304,000 red blood cells and hæmoglobin 87 and 95 per cent. respectively. Osler's case showed an increase in red blood cells. Ridder's case showed 4,400,000 red blood cells as the lowest count. Differential counts of the white cells have always been normal. Lipæmia has been noted. No unusual blood cells have been reported by any of the authors.

Potter and Milne suggest that an excessive blood destruction must have occurred in some cases as the accumulation of pigment was enormous and occurred within a short period of time. They note, however, that generally speaking the destruction of blood must be slow to permit a more or less complete regeneration as indicated in high blood counts commonly found.

M. E. Abbott who studied the only complete case of hæmochromatosis reported in a woman, believed that simple blood destruction in itself did not cause hæmochromatosis, but that another factor such as degeneration of cells of certain organs whereby they were unable to throw off the pigment reaching them, must be associated with it. She believed that with the disintegration of these cells the liberated pigment induced an interstitial inflammation and cirrhosis of these organs. The whole process was supposed to have some active cause leading alike to blood destruction and cell degeneration, such as a bacterial infection with chronic suppuration or chronic intestinal disturbance. Adami believed that a true destruction of red blood cells occurs over a long period of time and also suggests that it is the result of bacterial invasion. Abbott believed that the pigment formation occurred before the cirrhosis, because evidences of broken down heavily pigmented liver cells lying in new formed connective tissue areas were found. Opie, Anschutz, Hintz, and Kretz have all made similar observations and draw the same conclusions. Abbott studied forty-one other cases in which a golden brown pigment could be demonstrated microscopically in the liver cells. Cases of pernicious anæmia were not included in this series. In four of these cases the presence of hæmosiderin was demonstrated. A history of localized blood disintegration or some chronic intestinal disturbance was revealed in all. Abbott also suggested that both hæmosiderin and hæmofuscin contain iron.

In his conclusions on a series of twenty-four cases Anschutz particularly brought out the fact that the blood destruction and the blood formation did not keep pace with each other, with the result of enormous deposits of pigment in the tissues. At the same time he noted a diseased condition of the glandular organs, which under some mysterious influence took up and bound large amounts of the products of blood destruction. In the organs in which evidence of degeneration was more pronounced, a reactive inflammation resulted in connective tissue growth. Diabetes, he claimed, is the result of these extensive lesions involving the pancreas.

Rossle held that the blood destruction was secondary to capillaritis with hæmorrhage and that the abnormal hæmolytic and phagocytic activity of the liver cells accounted for the marked pigmentation of that organ. Pigment, resulting from destruction of red blood cells in liver cells, was later disseminated by the blood stream through the whole body. He believed that after this stage there is rapid regeneration of blood. Potter and Milne substantiate the finding of phagocytosis of red cells by the liver cells under pathological conditions, but, at the same time, believe that these liver cells are degenerated. They ask why should spontaneous phagocytic activity on the part of liver cells for red blood cells alone occur and if this is the cause of hæmachromatosis, why is the condition so rarely seen clinically.

Marie believed that there was some primary cause for the dissolution of hæmaglobin in the blood and tissues as shown by the presence of pigment in the various body cells. He advanced the idea that this pigment in the cells was laid down by the cell as a protection against the irritating substance destroying the hæmoglobin. This pigment in turn causes degeneration and destruction of these cells with supplementary elimination by way of lymphatics and overloading of the lymph nodes and production of inflammation and fibrosis. He concluded that bronzed diabetes was neither an ordinary clinical nor pathological diabetes, but rather a clinical entity in itself.

Achard, Dutournier and Jeanselme reiterate the statements of Marie, and as expressed by Futcher, they presuppose an unknown type of blood destruction. Opie expresses the opinion that under the conditions of the disease there is an active hæmolytic and toxic substance in the blood which transforms hæmoglobin into hæmosiderin. Buss studied one case and come to the conclusion that primary blood dissolution was the ætiological factor of the fibrosis and diabetes.

Hunter in 1888 was the first to contest blood destruction as primary in the process. He showed that hæmorrhage into the skin would only cause a local deposit of iron-containing pigment and no accumulation elsewhere. Cases of epistaxis and chronic suppuration were studied by Abbott and a case of purpura by Zaleski, without finding any deposit of iron pigment. Futcher did not find any pigment deposit in a case of purpura and Hiss and Zurhelle had similar negative findings in a case of hæmoglobinuria.

Kretz studied cirrhosis of the liver and in fourteen of twenty-six cases he found there was hæmosiderin in the liver. He concluded that the same toxic substance caused degeneration of the liver cells and injured the red blood cells. Abbott also found hæmosiderin in six out of sixteen cases of cirrhosis of the liver and concluded that the two factors, liver disease and blood cell destruction were essential. She noted œsophageal hæmorrhage and other hæmorrhages in these cases of cirrhosis. However, Marie regarded the tendency to hæmorrhage in hæmochromatosis as a secondary manifestation. Potter and Milne believed that these hæmorrhages found in hæmochromatosis were no more than those seen in any ordinary cirrhosis of the liver. Anæmia is usually slight or absent and evidence of blood destruction was not found by them.

Sprunt noted that the pigment deposit varying considerably in quantity, exceeded that in pernicious anæmia. He further observed that the bone marrow was not actively hæmopœtic and in the study of three cases but one showed slight hyperplasia. He concluded that the findings were insufficient to signify blood destruction since in hæmochromatosis other pigments are found having no relation to hæmoglobin. Elmer studied hæmochromatosis and found no anæmia, hæmolysis nor hyperplastic bone-marrow.

French found no free pigment in the blood, but all of it was intracellular, and on this account concluded that the pigment formation did not occur in the blood stream but in the living cells.

Experiments have rather proved against an abnormal blood destruction as the primary cause of hæmosiderosis. Auscher and Lapique injected blood into the peritoneal cavity and found iron pigment in the spleen but not in the liver. He considered that he had produced hæmochromatosis but no connective tissue increase or inflammatory reaction in the tissues. Biondi gave toluylendiamin by mouth and subcutaneously to produce blood destruction. He produced anæmia, jaundice, hæmoglobinuria, pigmentation of liver, spleen, bone-marrow, lymph nodes and occasionally kidney. His conclusions were that this hæmoglobinæmia which he had produced caused the liver cells to increase their secretion of bile, even to such an extent as to cause jaundice without obstruction of the bile passages. The other part of the hæmoglobin molecule, the iron-containing one, was taken up by leucocytes and distributed to other organs. He only found hæmosiderin in degenerated liver cells, and inferred that the diseased liver cells lost their normal capacity of ridding themselves of iron-containing pigment and that siderosis was but the expression of this fact. Sprunt discussed this experiment and concluded as there was no cirrhosis that it had no bearing upon the case in point.

Rolleston suggested that since in chronic hæmolytic jaundice there is destruction of red blood cells, the absence of jaundice in hæmochromatosis would argue against the existence of active hæmolysis.

The theory that the pigment under discussion is produced in the various parenchymatous cells or by some chemical change in the chromogenic constituents of cells was advanced by Mosse in 1894. He held that pigment was formed universally, even in the deeper cells of the Malpighian layer of the skin and was not transferred from other places of formation. The pigment accumulation in the liver is in proportion to the specialization of these cells to the chromogenic function and to the volume of blood which transverses it. He also believed that hyperglycæmia altered the blood before this specialization. On the other hand Macallum stated that iron is found in all nuclei in amounts proportionate to the chromatin present in the cytoplasm of all gland cells producing ferments. Opie suggested that the same condition which causes the deposit of pigment favours chromogenic metabolism, especially in the liver, which is present under normal conditions. This chromogenic metabolism may be the cause of pigment deposits in other organs, or it may be that the iron-containing derivatives of hæmoglobin are not eliminated by the liver and are left in the blood.

Parker believed that there was no unusual blood destruction but that there was an accumulation and lack of elimination of the normal end products. The hæmoglobin lies where it falls and undergoes some chemical change. He concludes that some toxic agent causes degeneration and chronic inflammatory changes in the liver and pancreas. Heller and Martineck are of the same opinion. Parker refers to Croftan's experiments and states that when the pancreatic lesion is of sufficient intensity there is insufficient glycolytic ferment produced by the islands of Langerhans, to act with the muscle ferment in the oxidation processes of carbohydrate metabolism. The glycogen then is not stored and a hyperglycæmia results, which in turn, causes the changes of hæmoglobin into hæmosiderin, instead of bile pigment. He also pointed out that if the liver be normal the pigment is removed and the case is one of frank diabetes, whereas if the liver is cirrhotic the pigment is not eliminated and accumulates with hæmochromatosis as an end result.

Recently Garrod, Gaskell, Sladden, Wallis and Vaile together have reported a case in which they favour the idea of defective elimination because they did not find iron in the bile, fæces, or urine. They found that there was an increased amount of iron in the blood (from 0·042 to 0·048 and 0·056 per cent.). They proved pancreatic insufficiency the cause of the diabetes. Of note is that they also found hæmosiderin in the distal convoluted and collecting tubular renal epithelium in bronzed diabetes and in the proximal convoluted tubules in pernicious anæmia. They brought out the old theory of resorption of certain substances by the collecting tubules, in explanation of hæmosiderosis in bronzed diabetes as a result of defective elimination.

Brown attempted to prove that the process of pigmentation is not hæmolysis but autolysis. He placed rabbit's liver in moist aseptic chambers and incubated at 37°C. The results of his experiments showed an increase in the iron-containing pigment near the exposed or outer surfaces, and from this he concluded that hæmosiderin was the oxidation product of hæmoglobin due to enzyme action. Along these lines Sprunt suggested a widespread parenchymatous degeneration of a specific nature affecting many organs and leading to the deposit of a variety of pigments depending upon the chemical process in the cells. Moreover, he found little justification for the theory of primary blood dyscrasia since no anæmia was present and the bone marrow was negative. The pigment also exceeds that found in pernicious anæmia and he holds that it is a different chemical nature. He concludes that hæmochromatosis is a metabolic disease implicating many tissues and manifested by changes in the chromogenic groups or protein molecules of cells with the deposit of pigment. As a result of pigment accumulation in the interstitial tissues there occurs a reactive inflammation with fibrosis in various organs.

Sprunt, Colwell and Hagan supporting the theory of autolysis and following Brown's experiment placed sections of the perfused liver of a rabbit into aseptic moist chambers and incubated at 37°C., while others were exposed to sunlight. They did not get constant results. From their observations they have shown that iron-containing and other pigments may be found during autolysis of the parenchyma independent of hæmoglobin and hence are derived from the protein constituents of cells. Gortner has demonstrated that the pigmentation of the integuments of larva to be the result of the interaction of oxydase and chromogen. The chromogen is present in very small quantities and is probably secreted only as needed for pigmentation while oxydase is present in relatively large amounts. The pigmentation produced by autolysis can, therefore, be explained by the action of oxydases on the chromogenic radical of the protein molecule. It is known that excessive chromogenic material is present in peculiar degenerations of the cell protoplasm and when acted upon by the ever present oxydase is precipitated a pigment.

Hess and Zurhelle believed that increased blood destruction is not necessary but that the abnormal retention of pigment is sufficient to explain this condition. They estimated 38·7 gm. of iron in the liver of their case which is one hundred times that of normal liver, fifteen times that of hæmoglobin and ten times that of the whole body; and in the pancreas, heart, and lymph nodes, 12 gm., totalling about 50 gm. in the body. They estimated the whole amount in normal blood at 2·4 gm. Since about one tenth of the red blood cells are dissolved in one day thus liberating 0·24 gm. iron and if little were lost by excretion it would require about seven months to produce the amount found in their case. This would be a very short time for this disease to develop.

Similar large amounts of iron have been isolated from the liver by Anschutz, Muir, and Dunn. The latter authors estimate that the total quantity in the body in bronzed diabetes is well over 40 gm., while under normal conditions there is not over 5 gm. They point out that the food is the ultimate source of the iron of the body and that the daily intake cannot be more than 30 mgm. If the source of the iron deposits were alone from the food, it would take some three years to accumulate the quantity found in the tissues in bronzed diabetes. As Garrod was unable to find any iron in the urine, bile, or fæces in bronzed diabetes, it would appear that there was an unusual retention of these substances by the tissues. In marked contrast are the results of iron deposit in pernicious anæmia where the various excreta contain iron bearing subtances, while the remaining surplus accumulates in the tissue. Under experimental conditions this tissue accumulation is only transient in that with the removal of the blood destruction the pigment substances soon leave the tissues. There is much to be said for the contention that bronzed diabetes is in great part determined through an unusual iron retention of the tissues. Muir and Dunn suggest that many tissues have an unusual affinity for iron in this disease.

In a subsequent series of experiments the authors demonstrated that iron is rapidly stored in the liver and other organs during an experimental anæmia. The iron in the liver and kidneys is, under these conditions, increased five fold and in the spleen three fold. Nearly all the iron attending the destruction of blood accumulates in the liver, spleen, and kidneys. A relatively small amount escapes in the urine. It was further found that the iron stored in various organs again disappears with the regeneration of blood and probably has been utilized in the process of blood formation.

Since Hanot's report in 1882, most of the French authors have held that diabetes was the primary condition leading to blood alteration and destruction. In 1882 Hanot and Chauffard found that pigment hypergenesis of the liver cells was due to nutritional disturbance brought on by an associated diabetic endarteritis. They believed that the pigment was distributed from the liver as emboli. Letulle suggested hyperglycæmia as the cause of the blood destruction and said that the pigment was formed everywhere and accumulated in situ, especially in dead liver cells. He discredited Hanot's idea of hypergenesis particularly as he noted degeneration and pigmentation of heart cells. This observation led him also to believe that the embolic theory of Hanot's was not tenable. Brault and Galliard laid stress on diabetes as the etiological factor in the pigmentation because it seemed that in this disease the hæmoglobin is rendered incapable of transformation into normal bile pigments. They considered diabetes and liver cirrhosis concomitant, in which the degenerated liver cannot elaborate and utilize the altered blood pigments. Hernandez thought that the dissolution of hæmoglobin was due to the diabetes and that the pigments deposited in the cells of the liver altered their nutrition and finally caused their destruction. He held that the pigment could be carried by the lymphatics. Mosse believed that hyperglycæmia caused the dissolution of hæmoglobin and that the pigment deposit in the liver was in proportion to the specialization of the chromogenic function of liver cells and also to the volume of blood passing through the organ. De Massary and Potier confirm this.

Rendu and de Massary advance the hypothesis that pigment is deposited in various cells by the abnormal action of tissues on the hæmoglobin. This altered metabolism is but the manifestation of a general cachexia caused by diabetes associated with cirrhosis of the liver. Naunyn ascribed the diabetes in some cases of hæmochromatosis to cirrhosis of the liver. Potter and Milne claim that in 2 per cent. of cirrhosis of the liver there is diabetes while Palma and Van Noorden hold diabetes and cirrhosis so rarely concomitant that it is only a coincidence. Simmonds reports cirrhosis of the liver in 5 per cent. of diabetes. Futcher noted bronzing in 2 per cent. of 256 cases of diabetes.

Buss found that glycæmia may result in incomplete oxidation of altered hæmoglobin. Parker has questioned the relation of diabetes to pigmentation. In ordinary diabetes there is no accumulation of iron pigment as indicated in the studies of Zaleski, Kretz, Hanot, and Hanseman.

Another group consisting mostly of German authors have considered cirrhosis of the liver and diabetes concomitant but that the diabetes comes on when interstitial fibrosis of the pancreas has reached an advanced stage. This view based upon the clinical finding of diabetes as a terminal condition is at present held by most authors. The diabetes is often very severe after the patient has shown pigmentation of the skin. The patient usually lives but a year or a little more and dies in diabetic coma.

The true sequence of events as believed by Marie, Acard, Dutournier, Jeanselme, Anschutz, and Opie is that blood destruction or altered chromogenic function with or without concomitant degeneration of liver and pancreas, or with subsequent interstitial inflammation and fibrosis of the liver and pancreas, is the first stage of the disease or simple hæmochromatosis, and that when the chronic intra-acinar pancreatitis has reached a sufficient degree of severity the characteristic symptoms of diabetes develop. Potter and Milne hold that in every case of liver cirrhosis hæmosiderin may be found in some of the organs and that hæmochromatosis is but an exaggeration of this. The cirrhosis is primary and is the result of the same toxic agent which produces the blood destruction. The pancreas may be damaged as a sequel to or coincident with the cirrhosis of the liver, or on the other hand, it may be due to a catarrhal inflammation of the secretory channels of pancreas with secondary atrophy and sclerosis.

In our own case no blood counts were recorded which would indicate the degree of blood destruction, but the patient was observed to be quite anæmic for a long time. He had, however, never had any gross hæmorrhage. One point of note is that our patient had been a plumber the greater part of his life and might have suffered, although never recognized, lead poisoning with its associated blood destruction.

We consider blood destruction to some degree a factor in the production of hæmochromatosis, pointing out that blood counts had only been taken during the later stages of the disease in other reports. I have noted in a case of primary carcinoma and cirrhosis of the liver as well as in several cases of pernicious anæmia a considerable pigmentation of the liver and spleen. The distribution of pigment in these cases is both in Kupffer's cells and liver cells, but in considerably smaller amounts than in bronzed diabetes. I have also noted in a case, twice having chronic lead poisoning, an iron-containing pigment in the Kupffer and parenchyma cells of liver. Ophuls in his reports on chronic nephritis by lead poisoning has likewise noted pigment deposits. A case of advanced tuberculosis with marked anæmia reported by Roque, Chalier, and Josserand showed pigment deposits especially in the liver and spleen, an advanced stage of hæmochromatosis.

The small amount of iron-containing pigment in the kidney was remarkable in comparison to the deposit found in other organs. In our analysis of tissues in pernicious anæmia a much larger quantity was found in the kidney. These results are parallel to the urinary findings, where no particular pigment is observed in bronzed diabetes while a varying and even marked amount may be observed in pernicious anæmia. The difference suggests the lack of a mobile pigment in the former. It is of interest, however, that whereas in bronzed diabetes the pigment deposit in the kidney is localized to a few cells, that in the anæmias the deposits may occupy various portions of the tubules. The presence of iron-containing pigment in the fæces, in view of the liver cirrhosis and the associated portal stasis and hæmorrhage, has no renal significance.

The experiments of Auscher and Lapique, Meunier and Biondi, have shown that blood destruction caused a deposit of iron-containing pigment in varying amounts. These experiments show that some added factor must be necessary to produce fibrosis. Time may be that factor because the portal cirrhosis of the liver in bronzed diabetes is of long duration, while the experiments and the course of pernicious anæmia are usually more acute. Alcoholism or lead poisoning may also be an associated exciting factor.

In our case, pigment deposits as well as sclerosis were found in large amounts in the liver, pancreas, lymph glands about the pancreas, spleen, heart, thyroid, and adrenal. It is possible that it was present in more tissues. Others have found iron-containing pigment in Brunner's and the glands of stomach, duodenum, and small intestine. Likewise pigment has been found in the parathyroids and the glands about the trachea, bronchi, and larynx as well as in the skin, œsophagus, aorta, submaxillary, axillary, mesentery, and mediastinal glands, in cartilage cells of trachea and costal cartilages, in the kidneys, bone marrow, and in several cases in the testes, prostate, vas deferens, seminal vesicles, and urethral epithelium.

In the case reported, definite pigmentation of the skin was not noted at autopsy, but a slight and varying pigmentation of the exposed surfaces was noted clinically. The skin pigmentation is the not uncommon clinical feature of the disease by which it is recognized during life. When present it is most marked on the exposed parts, the face, neck, back of hands, shins, in the axilla and groin and about old scars and is of a diffuse slaty blue or brownish gray colour with darker spots like freckles. No pigment is seen in the sclera or on the mucous membranes.

The distribution of the iron pigment in cells is not regular. Side by side one collection of cells may be filled with granules, while others nearby may show little or none. There is commonly no relation between the pigmented cells and the blood or lymph channels. It has been suggested that the pigment accumulates in the cells on account of an abnormal condition under which they are placed, and that cells which normally have no relation to pigment production are found to deal with this unusual product.

Of the chromogenic metabolism of cells we know but little. The accumulation of blood derivatives might result from the hæmoglobin reducing processes of the liver and heart, but this would hardly suffice to indicate the mode of deposit in the lining cells of the thyroid and pancreas. There can hardly be any doubt that there is some alteration in the chemistry or selective activities of the various cells whereby they show an abnormal property of taking up iron pigment. Whether the excretory organs themselves have an unusual ability of withholding iron from their secretions is not clear.

The pigment is not only distributed to glandular cells, but also to connective tissue, endothelial and lymphatic cells. These cells obtain their pigment directly from the blood as is indicated in the widespread and irregular distribution with no relationship to other structures. Free hæmoglobin has not been demonstrated in any of the reported cases, but this may be the result of faulty technique. The chemical tests for minute quantities of iron-containing pigment in the blood plasma are insecure, and spectroscopic methods have as yet not been applied in these cases.

Another point of contention and cause of much discussion is the finding of the two pigments, hæmofuscin and hæmosiderin, in almost all the organs. These pigments have commonly been found side by side and have about the same morphology, the hæmofuscin being of a canary yellow, while hæmosiderin is rusty brown and usually in large coarse clusters. Many authors have used some modification of Perls' reaction, obtaining better results with the hot hydrochloric acid as suggested by Abbott. In our case the pigment did not react to the original Perls' test but showed a slight reaction when the hot hydrochloric was used. On the other hand a brilliant reaction was obtained by Nishimura's ammonium sulphide modification of Perls. It would appear from our results that possibly all of the pigment is iron-containing, but some is more closely bound and hence more difficult to demonstrate. A similar view has been expressed by Abbott, Futcher, Hiss and Zurhelle, Sprunt, and others. M. B. Schmidt points out that although the pigment fails to respond to the available tests for iron, it is not necessarily iron free and hæmofuscin may be an older stage in the chemistry of the pigment.

In our case cirrhosis of the liver was not recognized during life, the liver being slightly enlarged and there being no ascites. The spleen showed no enlargement. There were no hæmorrhages. However, there had been a long period of dyspeptic symptoms with tenderness in epigastrium, which in the absence of any lesion in the stomach and intestines may have had some association with the cirrhotic liver. The fibrosis of the liver is probably not directly due to the pigment deposited in interstices by degenerating cells. as it is not disposed around the pigment masses. This can be said only in part of the other organs because some show evidence of irritation and an enclosing fibrosis. Particularly was this true of the lymph glands.

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THE MODERN LABORATORY INVESTIGATION OF A NEPHRITIC

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As a preliminary to the subject proper let me point out very briefly the present day conception of the rôle played by the kidney in the animal economy. Bayliss[1] in his recent work summarizes it as, first, the removal of non-volatile products of metabolism which are useless or injurious, and second, keeping the osmotic pressure of the blood constant. This osmotic pressure is due chiefly to the salts, and, their excretion must be increased or decreased according to the amount taken in with the food, and the excretion of water adjusted according to that taken in or lost in various ways.

For over seventy years two general theories of urinary secretion have existed—that of Ludwig on the one hand, and that of Bowman-Heidenhain on the other. According to Ludwig, secretion of urine is a process of simple filtration through the epithelium of the capillary wall and of the glomerular epithelium. With it are carried sodium chloride, other inorganic salts, and urea, and during its passage down the tubules concentration occurs by loss of water to the more concentrated blood and lymph.

On the other hand Bowman and Heidenhain held the glomerular process to be a secretory act, secreting water and inorganic salts, while urea and other urinary substances were secreted by the epithelium of the tubules.

Physiologists to-day are not agreed, but it is admitted that by whatever method, water and salts leave the kidney through the glomerulus and the majority incline toward the more active secretory method of Bowman-Heidenhain. Water is again resorbed by the urinary tubule epithelium and uric acid, phosphoric acid, and foreign substances are excreted here as well.

The functionating unit then of the kidney consists of a glom-

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erulus and the tubule which drains it into the kidney pelvis. Gerrish estimates that a normal kidney contains about half a million of such units and that the tubules would extend in total length about fifteen miles.

Just as the normal heart has a great reserve of power, so the kidney possesses a great reserve of function. Indeed it has been estimated that one half of one kidney or one fourth of the total kidney substance is quite able to carry on the necessary excretion. Herein lies the explanation of the fact that a person may live with a large portion of the kidney substance diseased. Under such circumstances, however, the healthy parts functionate under increased tension and must have a perfect blood supply. Any interference with this supply, either local or general, proves immediately serious. Similarly any poison or irritant substance provides a serious menace to such a case.

The blood supply of the kidneys is large. Councilman[2] estimates that this supply may vary nineteen times as much as the average supply to other organs.

The volume of urine eliminated varies with many factors, but chiefly with the fluid ingested and the condition of the circulation. If the blood is hydræmic from ingestion or from the elimination of exudates and œdemas, this favours the condition of polyuria. Rises of blood pressure tend in a general way to increase the amount excreted and *vice versa*. Of course, here it must be remembered that the rise in blood pressure may be offset by a constriction of the renal vessels. Drugs of the caffeine group produce diuresis largely by the improvement of the circulation through the kidney and partly by direct stimulation of the renal cells. Digitalis, in addition to helping the circulation dilates the renal vessels and according to some observers has a specific action upon the kidney cells.

Having thus briefly referred to this aspect of kidney physiology, let me refer back to what is designated as the kidneys first function, i.e., the removal of the non-volatile waste products of metabolism. Since protein substances are essential constituents of all living cells, and without them vegetable as well as animal life is impossible, it necessarily follows that we cannot adequately consider disturbances of kidney function without at least some familiarity with the more outstanding phases of the metabolic processes which concern these substances.

Proteins differ from fats and carbohydrates by containing nitrogen in addition to the carbon, hydrogen, and oxygen common to all. Generally sulphur and sometimes phosphorus are constituents. The most important element, however, is nitrogen.

Decomposition or cleavage of protein substances is brought about by hydrolysis, and this occurs in digestion by the action of the proteolytic enzymes. In this process the protein molecule is gradually broken down and less complicated aggregates first result which are known as proteoses, peptones, and peptides, and these still possess true protein characteristics. Further hydrolysis results in the transformation of these simpler protein substances into amino acids of a known chemical structure, and devoid of any protein characters. Thus from protein, of huge molecule, colloid, slightly soluble, and non-diffusible, we pass by way of proteoses, peptones, and peptides to a class of simpler crystalline substances which are for the most part readily soluble and diffusible. I shall not here enumerate the long list of these amino acids which is contained in any reference book.[3] Suffice it to say that they are most important, and are amphoteric, being able to form salts with both bases and acids.

Some of these amino acids are destroyed by intestinal bacteriæ but most of them reach the portal blood, thence through the liver to the systemic circulation where some of them are eagerly seized by the tissue cells and synthesized into the various complex proteins of the organism. Others remain in the blood and there is always a certain equilibrium between the amino acid content of tissues and blood.

In the process of tissue building the great diversity of amino acids required for different tissues leads to the rejection of some, which if not specifically required, are carried to the liver where the nitrogenous portion is converted to urea. In addition it is believed that there is a constant migration of amino acids from tissue due to disintegration of tissue proteins. Some of these are likewise in the liver converted to urea.

This conversion from amino acids to urea is carried out by:

1. Deaminization, or the splitting off of ammonia.

2. This ammonia unites with CO_2 of the blood to form ammonium carbonate.

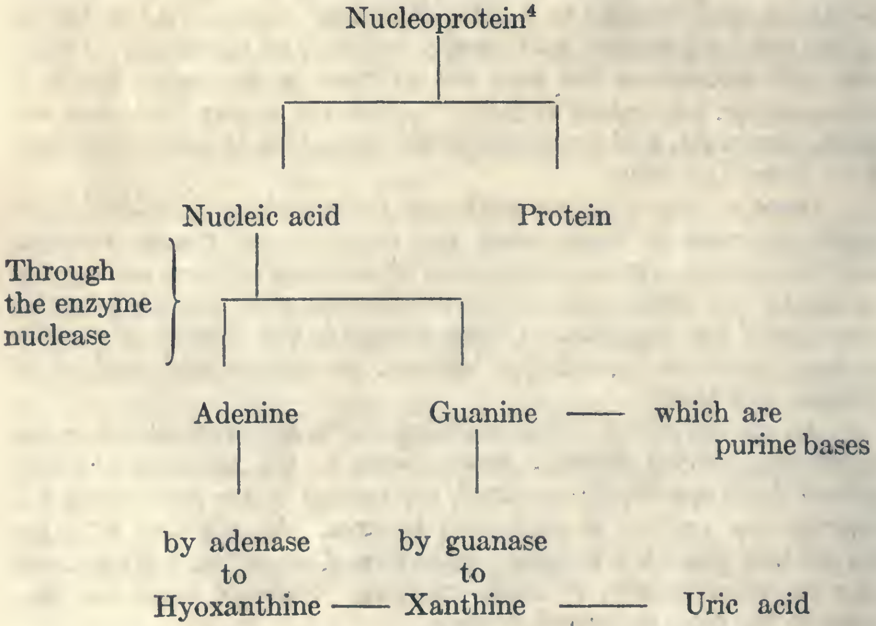
3. Which in turn is converted to ammonium carbonate,

4. And finally to urea, which is the principal end product of ordinary protein metabolism in human beings.

It is believed that other tissues of the organism besides the liver have very slight power of urea formation.

A second very important decomposition product of protein metabolism is ammonia, which may be liberated in the intestines during digestion and thence pass to the liver where it may be converted to urea. Some of this ammonia as well as ammonia from deaminization may escape transformation into urea, in order that when excreted by the kidney later it may neutralize the sulphuric, phosphoric, and uric acids of the urine.

A third product of protein cleavage is uric acid which arises from the breaking up of nuclear material. This process may be exogenous, in the intestines due to trypsin, or endogenous in the tissues due to a similar enzyme. Foods such as pancreas, thymus, liver, kidney, and testicles are rich in nucleoproteid.



A small amount escapes conversion into uric acid and gives rise to the purine bases of the urine.

The substitution[5] of uric acid for urea as the form of nitrogenous waste in reptiles and birds is an adaptation to conserve the water of the body and fit them for a dry climate. Uric acid has very little affinity for water and is almost insoluble, and in birds urine is excreted as crystalline masses, while urea has a great affinity for water and takes a great deal of water out of the body with it while being excreted. In birds, however, the formation of uric acid is analogous to the formation of urea in man, i.e., by a synthesis chiefly in the liver. In man, it is worthy of note, that a small part of the ingested purines are converted into uric acid later, and the remainder probably are destroyed by bacteria in the intestine or in the tissues.

Creatinine is a substance found in the blood and excreted in the human urine in amounts of 1 to 2 grams daily and is entirely independent of the protein intake. The amount is roughly proportional to the body weight—about 7–11 mgs. of creatinine nitrogen per kilo of body weight. This is termed the creatinine cœfficient.[6] It is found normally in the liver, heart, and voluntary muscle as well as in the brain, testicles, and some other organs. The antecedent state of creatinine is creatine and the muscles and some other organs including the kidney likely have the capacity of converting creatine into creatinine. Folin suggests, in view of all the known facts in reference to creatinine, that it is entirely endogenous in orgin and that it is an index of the real catabolism of the vital machinery of the body proper, in distinction from that catabolism which increases the free energy.

These then are the most important non-volatile products of metabolism which it is incumbent upon the kidney to remove, and even this brief and incomplete resumé of their origin and place in the economy of the organism may help to make clear some of the problems in dealing with our nephritics.

Turning now to the methods of attack in dealing with this subject, they naturally divide themselves into two groups: first, we may determine to what extent the kidney eliminates normal substances and also foreign substances such as drugs or dyes; and secondly, we may determine if any degree of retention of certain substances exists in the blood. The broad underlying principle of all tests then is that any depreciation of renal activity will be reflected in the urine on the one hand, and in the blood upon the other.

Let us first consider the examination of urine.

The elimination of water. The healthy kidney possesses to a marked degree the capacity of being able to adapt itself to any tendencies which are likely to alter the molecular concentration of the blood, e.g., the adding or subtracting of water from the blood. Normally water in excess is quickly eliminated by the glomerules and reabsorption in the tubules is inhibited, for, as you know, the glomerulus normally secrets a urine of low specific gravity, and the tubule absorbs water and some salts back into the blood again, thus concentrating it. If, on the other hand, the supply of water to the body is limited, the absorptive capacity of the tubules is given full play, resulting in a urine of high specific gravity and saving considerable water to the organism. This is the diluting-concentrating power of the kidney and obviously suffers in disease of the kidney in proportion to the amount of parenchyma involved. A normal kidney, by adapting itself to changing influences, gives a very varied secretion, while a diseased one tends more to constancy and invariability.

In order to test this capacity in the kidney a provocative polyuria[7] test is used. The patient empties the bladder say, at 7.30 a.m. and drinks one pint of water, on an empty stomach, and remains in bed during the test. Then collect urine at 8.30, 9.30, 10.30, and 11.30 and note the amount and specific gravity of each. In three hours the patient should have passed at least one pint of urine. Under normal circumstances the polyuria appears in the first half hour, and reaches its maximum soon after.

To render this test more comprehensive, Hedinger and Schlayer[8] have proposed a test to determine the water, salt, and specific gravity of two-hourly specimens. Their work shows how normal and diseased kidneys respond to a reasonable amount of fluids, salt and purine. More recently Mosenthal,[9] in an admirable paper covering a study of one hundred cases, elaborates upon their method and his findings and conclusions are exceedingly instructive. I here quote freely from his article and many of these charts are from the same source. His test meal for renal function as used at John's Hopkins Hospital is here given.

NEPHRITIC TEST DIET

For........ Date................

All food is to be salt-free from the diet kitchen.

Salt for each meal will be furnished in weighed amounts (213 gm.)

All food or fluid or salt not taken must be weighed or measured after meals and chartered in the spaces below;

Allow no food or fluid of any kind except at meal times.

Note any mishaps or irregularities that occur in giving the diet or collecting the specimens.

Breakfast, 8 a.m.:

Boiled oatmeal, 100 gms.
Sugar, 1 to 2 teaspoonfuls.
Milk, 30 c.c.
Two slices of bread (30 gms. each).
Butter, 20 gms.
Coffee, 160 c.c. }
Sugar, 1 teaspoonful } 200 c.c.
Milk, 40 c.c. }

Milk 200 c.c.
Water, 200 c.c.

Dinner, 12 Noon:

Meat soup, 180 c.c.
Beefsteak, 100 gms.
Potato (baked, mashed or boiled), 130 gms.
Green vegetables as desired.
Two slices of bread (30 gms. each).
Butter, 20 gms.
Tea, 180 c.c.
Sugar, 1 teaspoonful } 200 c.c.
Milk, 20 c.c.
Water, 250 c.c.
Pudding (tapioca or rice), 110 gms.

Supper, 5 p.m.:

Two eggs cooked in any style.
Two slices of bread (30 gms. each).
Butter, 20 gms.
Tea, 180 c.c.
Sugar, 1 teaspoonful } 200 c.c.
Milk, 20 c.c.
Fruit (stewed or fresh), 1 portion.
Water, 300 c.c.

8 a.m. No food or fluid is to be given during the night or until 8 o'clock the next morning (after voiding), when the regular diet is resumed. Patient is to empty bladder at 8 a.m., and at the end of each period, as indicated below. The specimens are to be collected for the following periods in properly labelled bottles, to be furnished by the chemical division of the medical clinic:

8 a.m. to 12 n.; 12 n. to 2 p.m.; 2 p.m. to 4 p.m.; 4 p.m. to 6 p.m.; 6 p.m. to 8 p.m.; 8 p.m. to 8 a.m.

Specimens are to be left in the ward until called for at 8.30 a.m. by an attendant from the chemical laboratory.

The above dietary contains 13·4 gm. N., 8·5 gm. NaCl. and 1760 c.c. of fluid and considerable purin material in meat, soup, tea, and coffee. It is in no way a specific one but merely such as may be supplied in almost any home and contains a sufficient quantity of diuretic material to make an adequate demand on the kidney to test renal function.

Patients are requested to take no solid food or fluid between meals or during the night, and each two-hour specimen is collected promptly, and the night urine secured ere breakfast is eaten.

If patients are irrational, or involuntary, piecemeal studies alone are possible, but such, repeated as occasion offers, supply much valuable data.

In a normal individual the points noted below are the important ones to observe in the response to a nephritic test meal:

1. Variations in the specific gravity of the urine—usually an average of at least ten points.

2. Balance between intake and output of salt, nitrogen, and fluids—should be approximately equal.

3. Night urine—should be of high specific gravity (above 1016), high in percentage of nitrogen (above 1 per cent.), and small in amount (400 c.c. or less) regardless of fluid ingested. This is the concentration power of the kidney.

NORMAL RESPONSE TO NEPHRITIC TEST MEAL

			NaCl		Nitrogen	
Time of day.	Amt.	Spec. Grav.	per cent.	Grams	per cent.	Grams.
8—10 a.m......	153 c.c.	1016				
10—12 "	156 "	1019				
12— 2 p.m......	194 "	1012				
2— 4 "	260 "	1014				
4— 6 "	114 "	1020				
6— 8 "	238 "	1010				
Total day........	1115	....	....	9·36	....	7·32
Night 8—8......	375	1020	....	2·36	1·23	4·61
Total 24 hours...	1490	....	....	11·72	....	11·93
Intake..........	1760	....	....	8·5	....	13·4
Balance.........	+270	....	....	–3·22	....	+1·47

In disease conditions the kidney shows its dimished capacity by:

1. Fixation of concentration—or hyposthenuria, of Koranyi.

2. Some retention of one, two, or three of the following—sodium chloride, nitrogen, or water.

3. The night urine shows polyuria—an amount over 400 c.c. and not merely frequency of micturition. This is often the earliest symptom of renal disease. Lower specific gravity and lower nitrogen concentration are also frequently met. Normally, after nitrogen intake, its appearance in the urine is somewhat delayed, giving rise to disproportionately high nitrogen content in night urines over that of the day, commonly above 1 per cent.

Diseased conditions giving rise to variations from the normal findings, in addition to the nephritides, are œdema due to cardiac decompensation, severe anæmia, diabetes insipidus, conditions of back pressure on the kidney, as in hydro-nephrosis, hypertrophied prostate, and other kidney conditions such as the ascending infections.

Specific Gravity of Urines Collected in Two-Hourly Periods

Case	Specific Gravity						Variation in Degrees
Normal	16	19	12	14	20	10	10
Incipient primary contracted kidney	09	14	09	10	14	06	8
Incipient primary contracted kidney	18	09	16	22	13	10	11
Advancing primary contracted kidney	18	17	13	13	13	15	5
Advancing primary contracted kidney	19	20	20	20	21	20	2
Advanced primary contracted kidney	11	11	10	11	11	11	1
Advanced primary contracted kidney	12	11	11	11	12	13	2
Advanced primary contracted kidney	10	09	10	09	09	10	1
Advanced primary contracted kidney	05	06	07	08	..	08	3
Incipient chronic diffuse nephritis	25	..	24	33	28	30	9
Incipient chronic diffuse nephritis	09	16	15	17	12	07	10
Advanced chronic diffuse nephritis	12	11	14	11	13	11	3
Secondary contracted kidney	09	10	12	10	12	10	3
Myocardial decompensation—congestion	18	20	19	18	20	21	3
Mycocardial decompensation—congestion	25	24	24	25	24	21	4
Myocardial decompensation—congestion	12	15	10	15	13	10	5
Polycystic kidney	10	10	10	11	10	10	1
Marked anæmia	10	10	10	10	10	11	1
Diabetes insipidus	04	04	06	04	04	04	2
Cystitis, pyelitis, prostate hypertrophy	10	10	10	10	11	11	1
Pyonephrosis	11	12	12	12	13	12	2

These are day urines. Noted fixed specific gravities.

Chart Showing (1) Fixed Specific Gravity, and (2) Constancy of Nocturnal Polyuria, in a Case of Advanced Chronic Diffuse Nephritis

Volume of Urine c.c.		Specific Gravity		Volume of Urine c.c.		Specific Gravity	
Day	Night	Day	Night	Day	Night	Day	Night
1390	560	12	10	1525	1090	12	11
935	710	12	11	1400	1260	11	10
1010	760	11	10	1146	1100	11	12
1122	705	10	10	1940	1060	10	09
790	790	10	10	1280	1520	10	09
908	1110	11	10	1640	1400	10	10
880	1184	11	10	1370	1370	11	10
1020	1360	12	09	1480	1480	18	18
1075	1120	11	10	1340	1680	19	17
1149	1255	10	10	1410	1340	10	10
1375	730	12	11	1480	1410	12	10
1600	1160	12	10	1184	1610	10	08

CHRONIC INTERSTITIAL NEPHRITIS

In early nephritis variations in renal function do not necessarily parallel the anatomical changes or *vice versa,* owing to the great reserve of kidney structure. If there is a large percentage of kidney tissue diseased or destroyed the remainder must obviously functionate nearly up to, or quite up to, its full capacity, constantly, and hence little or no variations are possible in spite of varying demands. This gives rise to urines from hour to hour or even day to day of almost fixed characteristics, i.e., as to specific gravity, salt, and nitrogen.

Different stages are of course met, from slight nocturnal polyuria (more than 400 c.c.) with milder degrees of retention of salt and nitrogen, through various phases to the most severe cases.

These are summarized by Mosenthal as follows:

1. Nocturnal polyuria (over 400 c.c.).
2. Tendency to total polyuria (volume of urine equals or surpasses the volume of ingested fluids).
3. Fixation of specific gravity—gradually becoming more intense. Fixation at first occurs at higher levels and later at lower.
4. Fixation of two-hourly quantities, i.e., the usual polyuric response to meals is absent.
5. Night urine may drop to normal quantity but is of low specific gravity and nitrogen content.
6. Varying degrees of nitrogen and salt retention.

The accompanying tables indicate graphically the points enumerated.

EARLY HYPERTENSIVE NEPHRITIS

	Urine		Sodium Chlorid		Nitrogen	
Time of Day	c.c.	Sp. Gr.	Per cent.	Gm.	Per cent.	Gm.
8—10..........	465	1·009				
10—12..........	102	1·014				
12—12..........	205	1·009				
2—4..........	160	1·010				
4—6..........	116	1·014				
6—8..........	160	1·006				
Total Day.......	1,208			4·79		5·67
Night 8—8......	935	1·010	0·33	3·08	0·50	4·67
Total 24 hours...	2,143			7·87		10·34
Intake..........	1,760			7·50		13·40
Balance.........	−383			−0·37		+3·06

The nephritic test meal shows a tendency toward fixation of specific gravity and a distinct nocturnal polyuria in an early case of hypertensive nephritis.

REACTION TO NEPHRITIC TEST MEAL IN ADVANCED HYPERTENSIVE NEPHRITIS

	Urine		Sodium Chlorid		Nitrogen	
Time of Day	c.c.	Sp. Gr.	Per cent.	Gm.	Per cent.	Gm
8—10..........	133	1·010				
10—12..........	176	1·009				
12— 2..........	156	1·010				
2— 4..........	212	1·009				
4— 6..........	164	1·009				
6— 8..........	104	1·010				
Total Day.......	945		0·34	3·33		3·27
Night 8—8......	590	1·010		2·01	0·38	2·24
Total 24 hours....	1,535			5·34		5·51
Intake..........	1,510			5·80		2·20
Balance..........	−25			+0·46		+6·69

There is very marked fixation of the percentage figures for nitrogen and salt concentration and the specific gravity. There is evident nitrogen retention. The salt intake is too low to make it certain that a diminished ability to excrete salt does not exist.

EXTREME INTERSTITIAL NEPHRITIS

	Urine		Sodium Chlorid		Nitrogen	
Time of Day	c.c.	Sp. Gr.	Per cent.	Gm.	Per cent.	Gm.
8—10..........	24	1·005				
10—12..........	106	1·006				
12— 2..........	82	1·007				
2— 4..........	83	1·008				
4— 6..........	0					
6— 8..........	230	1·008				
Total Day.......	525		0·12	0·63	0·25	1·28
Night 6—8......	1,140	1·007	0·12	1·37	0·20	2·27
Total 24 hours...	1,665			2·00		3·55
Intake..........	1,850			6·00		13·00
Balance.........	+185			+4·00		+9·45

Note the low fixed specific gravity, the retention of salt and nitrogen, and the night urine which is increased in amount, shows a low specific gravity and a low nitrogen concentration.

RENAL CONGESTION, FROM MYOCARDIAL INSUFFICIENCY

These cases give the following characteristics due to the congestion and œdema affecting the kidney function:

1. Specific gravity fairly constant at a point about 1020.
2. Very low salt output.
3. Markedly good output of nitrogen—in contrast to that of salt.

4. An oliguria.
5. A normal night urine.

It is thus of considerable value to use a nephritic test meal to estimate roughly the degree of cardiac decompensation since the kidney is so sensitive to circulatory disturbances.

The following charts illustrate a couple of marked cases.

URINE IN MARKED CARDIAC DECOMPENSATION

	Urine		Sodium Chlorid		Nitrogen	
Time of Day	c.c.	Sp. Gr.	Per cent.	Gm.	Per cent.	Gm.
8—10	65	1·025				
10—12	53	1·024				
12— 2	51	1·024				
2— 4	49	1·025				
4— 6	37	1·024				
6— 8	57	1·021				
Total Day	312		0·58	1·81	1·53	4·77
Night 8—8	172	1·021	0·42	0·72	1·67	2·87
Total 24 hours	484			2·53		7·64
Intake	995			7·00		9·40
Balance	+511			+4·47		+1·76

Test meal in an individual with marked cardiac decompensation which has persisted for some time.

URINE IN EXTREME CARDIAC DECOMPENSATION

	Urine		Sodium Chlorid		Nitrogen	
Time of Day	c.c.	Sp. Gr.	Per cent.	Gm.	Per cent.	Gm.
8—10	61	1·018				
10—12	52	1·020				
12— 2	65	1·019				
2— 4	55	1·018				
4— 6	30	1·020				
6— 8	35	1·021				
Total Day	298			0·77		5·01
Night 8—8	275	1·021	0·31	0·85	1·85	5·07
Total 24 hours	573			1·62		10·08
Intake	570			5·00		12·00
Balance	–3			+3·38		+1·92

Note the high concentration of nitrogen as compared with the low figures for salt. There is a distinct oliguria. (The water output should be higher as general anasarca was present.)

In a combination of cardiac insufficiency and interstitial nephritis the urinary symptoms of either may predominate. The determining factor which decides the symptom type is probably whether or not the nephritis is so far advanced as to present an unchanging barrier to the influence of renal congestion.

CHRONIC DIFFUSE NEPHRITIS

Here the response to the functional tests vary as much as do the clinical symptoms. During œdema formation there is salt and water retention, nocturnal polyuria with good nitrogen excretion. Hence the urinary output is very like that of cardiac decompensation. While œdema is being eliminated salt and water are above the intake and night polyuria is marked.

CHRONIC DIFFUSE NEPHRITIS

	Urine		Sodium Chlorid		Nitrogen	
Time of Day	c.c.	Sp. Gr.	Per cent.	Gm.	Per cent.	Gm.
8—10..........	32	1·025				
10—12..........						
12— 2	54	1·024				
2— 4..........	64	1·033				
4— 6..........	64	1·028				
6— 8..........	66	1·030				
Total Day.......	280			0·50	1·91	5·34
Night 8—8......	595	1·016		0·46	0·93	5·53
Total 24 hours...	875			0·98		10·87
Intake..........	1,760			8·50		13·40
Balance.........	+885			+7·52		+2·53

Test meal in a case of chronic diffuse nephritis during the formation of œdema. The marked salt and walter retention, the night poyyuria and the high nitrogen excretion are characteristic.

CHRONIC DIFFUSE NEPHRITIS

	Urine		Sodium Chlorid		Nitrogen	
Time of Day	c.c.	Sp. Gr.	Per cent.	Gm.	Per cent.	Gm.
8—10..........	230	1·022				
10—12..........	130	1·025				
12— 2..........	118	1·022				
2— 4..........	136	1·022				
4— 6..........	96	1·020				
6— 8..........	108	1·014				
Total Day.......	818			8·24		9·71
Night 8—8......	950	1·014		7·61	0·73	7·14
Total 24 hours...	1,768			15·85		16·85
Intake..........	1,760			8·50		13·40
Balance.........	−8			−7·35		−3·45

The results of a test meal during the stage of elimination of œdema. Note the large amount of fluid, salt, and nitrogen excreted.

Chronic Diffuse Nephritis

	Urine		Sodium Chlorid		Nitrogen	
Time of Day	c.c.	Sp. Gr.	Per cent.	Gm.	Per cent.	Gm.
8—10..........	328	1·012				
10—12..........	174	1·011				
12— 2..........	248	1·014				
2— 4..........	279	1·101				
4— 6..........	88	1·013				
6— 8..........	100	1·011				
Total Day.......	1,217			4·08		9·88
Night 8—8.......	490	1·014		1·66	1·01	4·95
Total 24 hours...	1,707			5·74		14·83
Intake..........	1,860			8·50		10·30
Balance.........	+153			+2·76		-4·53

The marked involvement of renal function is evident from the low fixed specific gravity.

The Same Case One Month Later

	Urine		Sodium Chlorid		Nitrogen	
Time of Day	c.c.	Sp. Gr.	Per cent.	Gm.	Per cent.	Gm.
8—10..........	216	1·009				
10—12..........	75	1·016				
12— 2..........	156	1·015				
2— 4..........	124	1·017				
4— 6..........	186	1·012				
6— 8..........	380	1·007				
Total Day.......	1,137			3·41		6·82
Night 8—8......	400	1·007		1·52	1·17	4·68
Total 24 hours...	1,537			4·92		11·50
Intake..........	1,760			6·20		13·40
Balance.........	+223			+1·27		+1·90

The marked clinical improvement is reflected in the result which closely approaches the normal.

To sum up then, involvement of the kidney function is first evidenced by changes in the night urine:

1. Increase in the amount—nocturnal polyuria.
2. Lowering of specific gravity.
3. Lowering in the percentage of nitrogen.

One or all of these phenomena may be present.

In severe cases marked functional impairment is indicated by:

1. Fixed and low specific gravity of day urine.

2. A diminished output of salt and nitrogen.
3. Tendency to a total polyuria.
4. Night urine of (a) Increased volume.
   (b) Low specific gravity.
   (c) Low nitrogen content.

In diffuse or parenchymatous nephritis the picture is a variable one—but gives much helpful information, as it does also in cardiac decompensation.

Were kidney entirely uninfluenced by extrarenal factors, the examination of the urine for urea and total nitrogen would be much more conclusive than it is, as an estimate of renal function. The data so derived gives general information of very positive value indeed, but is not to be interpreted as necessarily a quantitative estimate of renal damage.

Before leaving the subject of the urine one must refer to the test introduced by Rowntree and Geraghty[10] in 1910—phenolsulphonephthalein. It is an excellent test, easily carried out and simply read if one possesses even a very primitive form of colorimeter. Its use is based upon the knowledge that a definite amount of the dye is excreted in two hours in health, while with disturbance of function marked delay occurs in its elimination. In health 60 per cent. is eliminated in two hours. Suffice it to say that since its introduction it has received world-wide recognition and is to-day looked upon as an exceedingly valuable test, for both diagnosis and prognosis.

It is especially useful in surgical procedures on the kidney—where the comparative function of each kidney is of great importance.

Let us then turn to the other method of attack in studying renal disorder, and that is to see what degree of retention, if any, is present, in the blood, of those substances which the kidney normally excretes in adequate amount. At an earlier part of my remarks I referred to the end products of protein metabolism with which of course the kidney is very specially concerned, since one of its chief functions is the elimination of such waste products. They are grouped together under the name of non-protein, or incoagulable nitrogen, and in this term are included urea, ammonia, uric acid, creatinine, creatin, and an undetermined fraction which includes amino-acid nitrogen, and may be termed residual nitrogen.

The accompanying chart indicates their percentages of the total non-protein nitrogen in both blood and urine.

THE COMPARATIVE NITROGEN PARTITION OF URINE AND BLOOD IN PER CENT. OF TOTAL NON-PROTEIN NITROGEN AS INDICATED BY MYERS AND LOUGH[11]

Fluid.	Urea N.	Uric Acid N.	Creatinine N.	Creatin N.	Residual N.
Normal Urine..............	85	2	5	4	4
Normal Blood..............	50	3	2	0·3	46
Uræmic Blood	75	2·4	2·5	0·5	20
Nephritic..................	55	2·2	2	0·3	41
Gouty.....................	50	6·0	2	0·3	42

These figures refer purely to the component parts going to make up the non-protein nitrogen and not at all to the amount of retention.

Progress along these lines of investigation is due largely to the work of Professor Folin[12] and his co-workers, also Frothingham,[13] Fitz,[14] Myers and Fine,[15] Benedict,[16] Foster,[17] Marshall,[18] and several other laboratory workers.

Normally these substances are found in the blood in a certain concentration, and if the kidney excretory power is markedly impaired it obviously follows that it will have difficulty in eliminating these very substances, upon the elimination of which it ordinarily expends so much of its energy, and that hence their concentration in the blood will increase.

Considering the most comprehensive first, non-protein nitrogen, Obermayer and Popper[19] first called attention to its increase in the blood in uræmic states. The normal amount in the blood is estimated as 25 to 30 mgms. per 100 c.c. although Gettler and Baker assign it an upper level of 45 mgms. In various kidney disabilities this may rise to over 350 mgms per 100 c.c. Frothingham and Smillie[13] have shown a very definite parallelism between the results of this and the phenolsulphonephthalein tests on the same cases.

Tileston and Comfort[20] in a very comprehensive study of one hundred and forty-two cases of considerable variety summarize as follows:

1. Fasting adults showed 22·9 to 25 mg. non-protein nitrogen per 100 c.c. of blood, and the urea nitrogen was 12 to 14 mg. per 100 c.c. of blood.

2. After full meals with meat there was a rise of 4·7 mg. of non-protein nitrogen and 2·5 mg. of urea nitrogen.

3. Cases of chronic nephritis, both interstitial and diffuse, without uræmia, showed moderate elevations, or were normal, while uræmic cases were all elevated.

4. Phenolphthalein tests were roughly proportional to the degree of retention, although some cases with good phthaleins showed retention.

5. Patients with over 100 mg. usually die within four or five weeks.

6. Nephritics with retention should have a restriction of protein which reduces the amount of retention.

7. In chronic passive congestion there is no retention of nitrogenous waste.

8. A marked elevation of N.P.N. makes a patient a poor operative risk.

9. Eclampsia seldom shows marked retention of N.P.N. and hence differs from true uræmia.

10. Compensated valvular disease, acute pericarditis, acute endocarditis, malignancy, typhoid, scarlet fever (uncomplicated), and acute rheumatism all gave normal values.

11. Thirty-six per cent. of all syphilitics examined, in various stages, showed a considerable degree of retention.

We may next turn to the urea of the blood, whose estimation has been rendered practical by Marshall with the urease prepared from the soy bean, which breaks up the urea and enables its estimation as ammonia. By reference to the table you will note the very large place which the urea occupies in the total non-protein nitrogen of the blood. Tileston and Comfort found it to be about 50 per cent. of the total N.P.N. in normal cases but in cases of marked retention the urea usually formed about 70 per cent. of it. They conclude that the determination of the total N.P.N. is of more value than the determination of the urea alone. Normal values for urea in the blood vary from 12 to 15 mgms. per 100 c.c.

The elimination of uric acid and its presence in the blood forms a very interesting chapter in pathological chemistry. In 1848, Sir A. B. Garrod[21] drew very interesting conclusions which are in surprising harmony with the views of to-day, especially when we consider the methods at his disposal. Until recently, no special advance has been made in the solution of this problem, and this advance is due to Folin's work and methods. Retention of uric acid even in large amounts, as evidences by recent methods of examination, does not necessarily lead to gout, but as Von Noorden[22] says, in addition to its retention there must be the accession of another unknown factor, before the deposition of uric acid occurs.

Uric acid is excreted by the kidney with greater difficulty than is the case with other nitrogenous waste products, urea, and creatinine. Creatinine is excreted most easily, then urea and then uric acid. This fact is evidenced by the appended chart of Chace and Myers[23] which shows graphically the "staircase" effect produced by these phenomena. High uric acid content of the blood was frequently noted without retention of any other waste products.

		Mgms per 100 c.c. of blood			Phthalein 2 hrs.	Syst.	Urine	
Diagnosis	Condition	Uric Acid	Urea N.	Creatinine N.	%	B.P.	Alb.	Casts
Pulmonary tuberculosis. .	Unchanged	6·5	16	2·7	58	130	++	+
Pericarditis.	"	5·6	13	2·1	45	150	–	–
Interstitial nephritis.	"	5·5	12	2·5	37	185	–	+
Diffuse nepritis.	"	9·6	19	2·4	45	175	+	+
Early interstitial nephritis..	"	9·5	25	2·5	13	185	+	+
Early interstitial nepritis....	"	6·6	24	3·3	26	185	–	+
Early interstitial nephirits..	"	8·7	20	3·6	20	100	+	+
Early interstitial nephritis..	"	6·3	31	2·0	23	150	–	–
Moderately severe chronic interstitial nephritis.	Improved	8·0	80	4·8	0	240	++	++
		4·9	17	2·9	10	170		
Moderately severe chronic diffuse nephritis.	Improved	8·3	72	3·2	25	238	+++	++
		5·3	21	1·9	43	145		
Moderately severe chronic diffuse nephritis.	Improved	9·5	44	3·5	38	210	++	++
		2·5	19	1·9	52	120		
Typical fatal case of chronic interstitial nephritis.	Died	22·4	236	16·7	0	210	++	pus
Typical fatal case of chronic interstitial nephritis.	"	15·0	240	20·5	2—3	225	++	+
Typical fatal case of chronic interstitial nephritis	"	14·3	263	22·2	0	220	++	+
Typical fatal case of chronic interstitial nephritis.	"	8·7	144	11·0	trace	225	+	+

Normal—uric acid 2—3 mg
urea 12—15 "
creatinine 1—2.5" } per 100 c.c.

Since uric acid is eliminated with most difficulty, it follows, that its retention would likely be among the first evidences of disturbed function. The normal content of the blood is 2 to 3 mgms of uric acid per 100 c.c. of blood.

According to the above statements then, we would infer that the retention of creatinine in the blood signified marked impairment of kidney function, since as Folin and Denis remark it is "removed by the human kidney with an ease and certainty, exceeded only by the facility of removal of the ammonium salts." Since it is so easily removed normally, its retention must mean very marked impairment of renal function. As already observed, creatinine on a meat free diet is entirely endogenous in origin and its formation is very constant. Hence a lowered nitrogen intake lowers the concentration of urea and uric acid, but does not influence that of creatinine. All cases, followed by Myers, with 5 mgms or over per 100 c.c. of blood have died. Normal values are 1 to 2·5 mgm. per 100 c.c. of blood.

Uric Acid in the Blood in Cases of Incipient Interstitial Nephritis.[23]

Diagnosis	Mg. to 100 c.c. blood			Phthalein	B.P.		Urine	
	Uric Acid	Urea Nitrogen	Creatinine	2 hrs.	Syst.	Diast.	Alb.	Casts
Interstitial nephritis	9·5	25	2·5	13	185	90	+	+
Fibrillation	9·3	14	2·9	44	120	90	–	–
Cirrhosis, nephritis, alcoholism	8·7	20	3·6	20	100	87	+	+
General œdema	7·7	20	2·6	45	168	100	+	–
Carcinoma of stomach	7·5	16	2·2	50	150	90	–	–
Interstitial nephritis	7·1	16	2·0	26	185	110	–	+
Carcinoma of stomach	6·8	20	1·8	40	140	80	–	+
Pulmonary and kidney Tuberc	6·5	16	2·7	58	130	90	++	+
Hypothyroidism and nephritis	6·3	31	2·0	45	150	90	–	–
Syphilis and nephritis	6·3	17	2·7	38	185	80	++	+
Chronic arthritis and nephritis	6·1	12	2·4	65	145	80	+	+
Pericarditis, alcoholism	5·6	13	2·1	45	150	65	–	–

Myers considers blood creatinine a much better prognostic guide than phthalein estimations, since the creatinine continues to show marked variations after the phthalein results are continuously negative, and hence variations in the patient's condition may still be taken cognizance of thus.

Prognostic Value of Creatinine in the Blood of Nephritis.[23]

Cases	Blood Creatinine	Phthalein 2 hrs.	Termination
1	33·3	....	Died
2	28·6	0	"
3	22·2	0	"
4	20·5	2–3	"
5	20·0	0	"
6	20·0	0	"
7	18.9	0	"

Prognostic Value of Creatinine in the Blood of Nephritis—*Continued*

Cases	Blood Creatinine	Phthalein 2 hrs.	Termination
8	17·8	....	Died
9	16·7	0	"
10	16·6	Trace	"
11	14·7	....	"
12	14·7	0	"
13	14·3	0	"
14	12·7	1	"
15	12·5	0	Stationary
16	11·1	3	Died
17	11·1	0	"
18	11·0	3 to 1	"
19	10·7	0–5–4–3–6	"
20	10·0	0	"
21	9·0	0	"
22	8·3	6–4–2	"
23	7·4	0	"
24	7·0	0	"
25	6·7	5	"
26	6·1	9	"
27	5·9	3	"
28	5·6	2–7–10	Improved
29	5·5	....	Died
30	5·4	13–4	Stationary
31	5·3	10	Died
32	5·2	....	"
33	4·9	....	"
34	4·8	0–10–31	Stationary

I should not conclude this part of my remarks without referring briefly to another method of estimation of the kidney function. I refer to Ambard's coefficient of urea excretion.[24] Ambard demonstrated that normally a constant relationship exists between the concentration of urea in the blood and the amount of urea excreted in a given portion of time, i.e., the rate of its execretion. In normal individuals this coefficient is held to be very constant but if the kidney function is impaired there is likely to be a relative increase in the concentration of urea in the blood and a relative decrease in its rate of excretion in the urine.

Ambard's first law is thus stated:

"If a constancy of the urea concentration in the urine is maintained, the square root of the urea eliminated in the urine in a definite interval is closely proportional to the concentrations of the urea in the blood." As variations in the concentration of urea in the urine alter the relationship of this to the urea concentration in the blood, Ambard formulated a second law to define the effect of this factor. His second law is: "If the blood urea remains at a constant concentration, the rate of urea excretion is inversely proportional to the square root of the urea concentration in the urine."

The rate of elimination of urea also varies with the body weight, and is constant per kilogram of body weight, if other conditions are constant.

Ambard's formula is as follows:

$$K = \frac{UR}{\sqrt{D\frac{70}{P} \times \frac{\sqrt{C}}{\sqrt{25}}}}$$

K —coefficient of urea excretion.
Ur —urea grams per litre excretion.
D —urea grams in urine in twenty-four hours.
C —urea grams per litre of urine.
P —body weight in kilograms.
70 —standard body weight in kilograms.
25 —standard concentration of urea grams per litre of urine.

The normal coefficient averages 0·080 and varies between 0·050 and 0·090. Deficiency in urea excretion results in higher values and this higher value is due to the changed ratio between urea concentration in the blood and the excretion by the kidney.

McLean[25] modified this formula by designating the ideal normal rate of excretion as 100 and his index in a given case then expresses "in direct percentage the rate of excretion found, in terms of the rate of excretion that a normal individual would develop under the same conditions as to the concentration in the blood, concentration in the urine, and body weight."

$$\text{Index of excretion} = \frac{D\sqrt{C} \times 8{\cdot}96 \ (\text{CONSTANT})}{\text{Wt.} \times UR_2}$$

D —grams urea excreted in twenty-four hours.
C —grams urea per litre of urine.
Ur —grams urea per litre of blood.
Wt —weight of body in kilograms.

The rate is not determined for twenty-four hours but for seventy-two minutes (i.e., $\frac{1}{20}$ of 24 hours).

The exact place these indices will assume in diagnosis and prognosis is by no means certain since very wide variations and discrepancies have been pointed out in individuals apparently in perfect health, by Addis and Watanabe.[26] Myers and Fine, as well as Jonas and Austin,[27] also criticize this method and claim the estimation of blood urea alone is more accurate, especially since slight carelessness in the collection of the urinary samples may very seriously affect the ultimate reading.

Mosenthal[28] has recently endeavoured to correlate some of the different tests of renal function and to indicate this approximately by + to + + + +, corresponding to slight, moderate, marked and maximal. I append his chart.

Scale of Degree of Impairment of Renal Function

Degree	Phthalein %	N.P.N. Blood mg. per 100 c.c.	Urea N. of Blood mg. per 100 c.c.	Ambard	Test Meal					
					Night urine		Variations in S. G. when highest S. G. is:			
					c.c.	s.g.	18	17 to 15	14 to 13	12
Normal	60+	30 –	15 –	0.090	400 –	18+	9+			
+ slight	59–40	31–45	16–27	0.0910 to 0.115	400–600	16 & 17	8 to 5	6		
++ moderate	39–25	46–65	28–44	0.116 to 0.220	600+	15 –	4 –	5 & 4	6+	
+++ marked	24–11	66–90	45–64	0.221 to 0.350	...	....	....	3 –	4 & 5	6+
++++ max.	10–0	91+	65+	0.351+	...	....	....	....	3 –	5 –

There is still another aspect of nephritis which is deserving of reference in view of recent methods of investigation. I refer to the subject of acidosis,[30] which quite apart from nephritis, has attracted so much attention of late, and especially in the cases of recurrent vomiting in children, which is looked upon as due to this condition. May I refer briefly to the underlying principles.

Normal metabolic processes require a circulating medium of very constant reaction. Normal blood reaction, like normal temperature, is one of the important physiological constants. This "reaction" of the blood is faintly alkaline, or its hydrogen-ion concentration is only slightly less than that of pure water. To L. J. Henderson[29] we owe our conception of this fact.

By hydrogen-ion concentration we mean that a solution is acid when it contains an excess of hydrogen over hydroxyl ions; neutral when hydrogen and hydroxyl ions are in equal numbers and alkaline when the hydroxyl ions predominate. In solution through the influence of the solvent (water) acids, bases, and salts, dissociate or ionize, and each ionized molecule becomes resolved into its positive and negative ions, and these are known as cations (+) and anions (—) carrying a positive and negative electrical charge respectively. The extent to which acids and bases ionize, since all do not ionize to the same extent, determines their strength as such. The application of this fact shall appear shortly.

Since cellular activity demands such a constant reaction, there must be some delicate regulatory mechanism which will rapidly respond to even very slight variations in the reaction and set in operation some process by means of which the normal reaction of the blood is restored. This sensitive mechanism is possessed by the respiratory centre. Pulmonary ventilation is increased over 100 per cent. by an increase in the hydrogen-ion concentration of the blood which is smaller than any known laboratory method may detect.

During metabolic activity there are added to the blood stream certain acid products, which are a volatile acid CO_2 excreted by the lungs and non-volatile acids, or "fixed acids" excreted normally by the kidneys. The normality of the blood reaction is maintained by the chemical composition of the blood and the excretion of these acid substances.

The chemical composition of the blood assists in this process owing to the large amount of weak acids and their salts which it contains, e.g. carbonic acid, phosphoric acid, sodium carbonate, sodium bicarbonate, monosodium phosphate, and disodium phosphate. Then in addition there are the proteins of both basic and acid properties. Indeed the balance of weak acids and salts is such as to allow the addition of the maximum amount of acid with the minimum change of reaction of the blood.

The above mentioned salts and alkali protein compounds constitute the alkali reserve of the plasma and any diminution of this alkaline reserve is known as acidosis, and is recognized by clinical symptoms, changes in the blood and alveolar air.

The chief acid product of normal metabolism is CO_2. A slight increase in its presence stimulates the respiratory centre causing added pulmonary ventilation and a return to normal with no depletion of the alkali reserve or "buffer" substances as Henderson named them. If, however, a non-volatile acid such as sulphuric, phosphoric, or betaoxybutyric acid is poured into the plasma some of this alkali reserve is used up and the reaction or hydrogen-ion concentration shifts toward acidity. This stimulates respiratory ventilation which being unable to remove non-volatile acids removes more CO_2 than normal to compensate for the increase in non-volatile acids which it is unable to remove, resulting in a lowered CO_2 content of the blood in the lungs, and hence of the alveolar air in contact with this blood, through the lung membrane. Then this blood with its diminished alkali reserve comes in contact with the tissues once more and receives the CO_2 normally produced, the change in the blood toward acidity is more marked and overstimulation of the respiratory centre again results. The body endeavours to replenish the alkali reserve by production of ammonia and by the selective excretion of acid by the kidneys, retaining the bases in the body to neutralize more acids. If, however, more acids continue to be poured into the plasma and the alkaline reserve is depleted in spite of all safeguards, the alkalinity becomes less and less and a point is reached which is incompatible with life and this point is practically neutrality.

Now as is evident from dyspnœa, many advanced cases of nephritis develop an acidosis, not so much due to the excessive formation of acids as in diabetes mellitus, but to the impairment of their normal elimination by the kidney. As an index of this condition the CO_2 tension of alveolar air was measured, since the CO_2 tension of alveolar air is the same as that of aerated blood leaving the lungs for the tissues. Another method was to test the hydrogen-ion concentration of the blood. However, recently Van Slyke[31] has introduced a fairly simple method of estimation of the CO_2 combining power of the plasma and several investigators have found this CO_2 combining power to be moderately to markedly reduced in diabetes and nephritis.

Now in closing I may say that the amount of blood required to do all of the tests for retention which I have indicated is not large—about forty cubic centimeters. It is easily secured and keeps very well on ice, and is not necessarily absolutely sterile.

My remarks have extended over more time than I had at first anticipated and there are some tests for the estimation of renal function to which I have not referred at all. Those I have not mentioned are not looked upon by our best trained investigators and clinicians as contributing much of value to our knowledge of this most fascinating subject of renal pathological chemistry.

Some of these tests may seem of too theoretical value to be of vital interest to the busy physician or surgeon, but one has merely to recall that the theoretical procedure of to-day is often the daily routine of to-morrow. A few years ago "acidosis" was a term seldom heard apart from diabetes and terminal nephritis, while now acetone bodies are commonly demonstrated in the urine of children quite apart from either of the above diseases.

But to the busy practising physician and surgeon may I commend the estimation, in all your patients with albuminuria, or high blood pressure, or œdema, of the two-hourly urine characteristics, while on some improvised series of test meals along the lines I have indicated. Accurately measure the quantity and specific gravity of both day and night urines, and watch for nocturnal polyuria with lowered specific gravity as an initial sign of impending trouble.

To this test add the phenolsulphonephthalein which is simply applied, and the colorimetric reading readily made on an apparatus available now for a few dollars. Adding this information to careful clinical observation you shall have obtained a very fair estimate indeed of the condition of that wonderful organ, the kidney.

I have purposely refrained from any attempt at classification of kidney disorders beyond the very rough one of interstitial and parenchymatous. An exceedingly interesting grouping of Volhard and Fahr promises to go far toward classifying more adequately than ever before the known clinical and pathological data of nephritis.

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FRACTURES OF THE SKULL FROM A NEUROLOGICAL STANDPOINT

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IT is necessary to confess at the outset that there are no neurological phenomena pathognomonic of fracture of the skull. The nervous symptoms that accompany fracture of the skull are not in essence due to that fracture, but result from injury to the intracranial contents and may be brought about by other lesions than a broken skull—any severe blow on the head, for example.

Such a blow on the cranium produces what we call concussion. It temporarily squeezes or crushes the brain. An animal's brain may be seen to be squeezed out into a trephine opening made for purposes of observation, if a blow is struck on the opposite side of its skull. Owing largely to the fact that the brain rests on a water cushion formed by the cerebro-spinal fluid, this compressing force affects the whole brain and not merely the site of the blow. The resulting rise of intracranial pressure tends to squeeze out the fluid contents of the skull and interferes for the time with the intracranial circulation. This interference with the cerebral circulation, combined with the effects produced upon the cells comprising the various nerve centres, is probably responsible for the initial symptoms of concussion, symptoms which vary greatly in intensity.

In the mildest cases there are transient giddiness, headache, flashes of light and ringing in the ears. In cases of moderate severity there are added to the above symptoms flaccidity of all the muscles and rapid unconsciousness, shallow breathing and weak pulse, followed perhaps by brief incoherence as consciousness returns, also complaint of headache, giddiness and tinnitus, an unsteady gait and a sense of fatigue.

In the more severe cases of concussion, to which a majority of the cases of fracture of the skull belong, there is sudden and profound unconsciousness, with great pallor, muscular relaxation and loss of reflexes, even, it may be, that of the pupils to light. Probably in the earliest stages the patient is pulseless and does not breathe, while wounds do not bleed. This very brief preliminary stage is rarely to be seen by a skilled observer. The pulse returns, weak and irregular at first, and shallow, irregular breathing is established. The blood pressure is low.

Many of the fatal cases of fracture of the skull never rally from the shock of this first stage.

Our experience at the Western Hospital is that the struggle in what prove to be the fatal cases of fracture of the skull is apt to be a short one, for of sixty fatal cases in the hospital records forty-five (or 75 per cent.) died on the day of the accident or the day following.

But in most of these fatal cases as well as in cases that recover, the bulbar centres (vasomotor, cardiac, and respiratory), stimulated by their anæmic condition, are urged to greater effort. Through vagus stimulation the heart becomes slower and stronger, respiration becomes deeper and stertorous, though often irregular or of Cheyne-Stokes type, and through action of the vasomotor centre upon vasomotor nerves the blood vessels contract. All this results in a rise of blood pressure considerably above normal.

The deep reflexes return and are frequently quite active. The patient begins to move and moans a little. Consciousness returns gradually. The patient is apt to be irrational for a time and is very irritable, often noisy, and strongly resents being examined or disturbed in any way.

Careful examination of the nervous system is necessary, in order that no localizing symptom may be overlooked—prolonged and profound mental disturbance in lesions of the frontal lobe, motor paralysis or Jacksonian attacks in Rolandic lesions, hemianopia in occipital lobe lesions, paralysis of the various cranial nerves. Sensory symptoms do not seem to be common and are hard to make out, owing to the patient's mental condition, but I have noticed some astereognosis in one or two cases.

But it is important to remember that such localizing lesions may be due to a focal inflammatory œdema, as well as to hæmorrhage or to bony pressure. I well remember the case of a young man who, after receiving a very severe blow on the left side of the head, followed by headache, loss of power to do his usual mental work and a marked rise of blood pressure, developed a decided weakness of his right arm. I was tempted to advise operation, but the negative finding on lumbar puncture led to a policy of watchful waiting which the event justified, for the weakness soon disappeared spontaneously.

Perhaps the commonest focal sign of value is the presence of a Babinski. The existence of dorsal flexion of the great toe on tickling the sole of the foot should be regarded with suspicion, even if present but for a short time.

It is remarkable how trifling may be the injury which will occasionally fracture a skull. For example, an Italian was taking down from a scaffold a board which he could readily reach from the ground. The end of the board, slipping, fell a distance of not more than eighteen inches, striking him on the head and knocking him down. He was brought to the Western Hospital and was quite conscious on admission, but soon became drowsy. When I saw him a couple of hours after admission, he had a one-sided Babinski and could hardly be roused. The lumbar puncture showed blood in the cerebro-spinal fluid. Immediate preparation was made for operation, but before this could be done, he stopped breathing. Fortunately a few artificial respirations and a large hypodermic of strychnine and atropine started him breathing again, and the operation was completed by Dr. Springle. The skull in the temporal region, which was of almost egg-shell thinness, was fractured. A large quantity of clot and semi-fluid blood was removed, partly intradural, but mainly of middle meningeal origin. Two days later the man was sitting up in bed calling for his dinner and he recovered completely.

Lumbar puncture in cases of suspected intracranial traumatism should always be resorted to. The presence (and the amount) of blood in the cerebro-spinal fluid and the increased tension the fluid is generally under are important guides to treatment. It is of some advantage to know the percentage of blood contained in the fluid withdrawn, and where the time necessary to do a cell count is lacking, a quicker approximate estimate may be made by measuring the hæmoglobin in the cerebro-spinal fluid and comparing this with the percentage of hæmoglobin in the patient's blood.

As to *Prognosis*, recovery is gradual and tedious. In most cases giddiness, more or less vasomotor instability, headache and inability to do as much physical or mental work as before the accident, are symptoms that last for months.

Our experience at the Western Hospital would seem to show that the danger to life is soon over in the majority of cases. Only ten of our sixty fatal cases lived more than three days, and but three lived more than five days after the accident. It is to be remembered in this connexion, however, that in a large proportion of our cases the violence of the blow was very great (tramway or railway accidents).

Dr. England tells me that in a general way it is his experience that, provided a case of fractured skull does not die as a direct result of the injury, those cases do best where the bone is severely crushed and the membranes and even the brain substance are badly lacerated—possibly because such cases are sure of good drainage. He refers to the cases of an old man and his wife, both struck by a street car some years ago. The man had only a dislocated clavicle and a lacerated hand. He died. His wife arrived at the Western Hospital with her head smashed in, very pale, with sighing breathing, apparently moribund. Pieces of bone were removed from as deep as the ventricles. The confident prediction was made that she could not live through the night, but she was conscious next day and made an uninterrupted recovery, complete except for a hemiplegia due to destruction of the motor area.

Dr. Springle has a similar case showing to what an extraordinary extent the brain may be damaged and recovery occur. A tramway trolley was pulled from its wire, so that the pole flew into the air, throwing off the end, weighing some twelve pounds. This fell on the head of a boy of nineteen, crushing in the vault of the skull. He was brought to the Western Hospital "in a dying condition", to quote the note made on his admission, brain, scalp and skull being intermixed in a horrid mess. Forceps had to be left for days in his brain as deep as the lateral ventricle, to control hæmorrhage. He recovered and two or three years later when examined for medico-legal purposes he had no paralysis whatever.

Bigelow's case of a man of twenty-five who had a crow-bar three feet seven inches long and one and one-quarter inches in diameter blown completely through his head, entering below the left zygoma and passing out near the coronal suture close to the middle line, reported in 1850, is still a most remarkable case, for the man was able to sit up and converse almost immediately after the accident and recovered completely except for blindness of his left eye.

Our Western Hospital statistics seem to show that women, though much less liable to fracture of the skull than are men, are a little more apt to die from it. Among one hundred and forty-five cases, twenty-four were females, of whom eleven died, twelve recovered, and one left the hospital on the day of admission (mortality 48 per cent.): of one hundred and twenty-one males, forty-seven (or 39 per cent.) died.

The complications to be feared are mainly infective, such as meningitis, abscess and sinus thrombosis, and need not detain us. A certain amount of inflammatory œdema of the brain and its membranes occurs in practically all cases and is an occasional cause of death.

So much for the prospect as to mortality. What is the outlook as to completeness of recovery?

In almost all cases certain symptoms of the so-called neurasthenic type last for some time—headache, impairment of memory, vasomotor instability, irritability, a sense of mental and physical exhaustion, and disinclination for exertion. In most cases I think such manifestations are due to real brain injury. These symptoms usually subside in time, though convalescence may take many months.

There are also various permanent disabilities which may be grouped together as due to destruction of brain tissue—aphasia or paraphasia, anosmia, hemiplegia and other paralyses, hemianopia or amblyopia. Mental symptoms occur in cases where the frontal region is affected and range from partial loss of memory to violent insanity or feeble-mindedness.

Finally, there is that considerable group of unfortunate cases where traumatic epilepsy follows the injury. The fits may not appear for some time after the accident.

Brief illustrations of some of these nervous sequelæ of fracture of the skull may be cited from the Western Hospital records.

Persistent neurasthenic symptoms with severe headache, giddiness, depression, and incapacity for mental or physical work lasted two or three years with very little improvement in a bricklayer who fell from a height on his head.

A boy aged fifteen following fractured skull had hemianopia and frequent epileptic fits with some mental deterioration. He had refused operation.

A girl aged seventeen struck by a locomotive had a depressed fracture of the frontal bone. The bone was raised, but the dura was not opened. Normal mentally before the accident, after it she was positively silly, refusing to let anyone "look at her pretty eyes," etc. Her memory too was almost nil. She was unable to find her way about the city alone and several months after the accident failed to remember (after an interval of two weeks) ever having seen the physician in regular attendance upon her.

Doctor Springle's case, already referred to, where extreme laceration of the brain occurred, showed a tendency to loss of self-control, undue suspiciousness and mental deterioration. This young man also took epileptic fits, first beginning some time after the accident, and had a prolonged series of fits (status epilepticus) which almost ended fatally.

Under the head of prognosis some reference should perhaps be made to the subject of blood pressure. It must be admitted that the information given by the study of blood pressure in fractures of the skull must be interpreted in correlation with other symptoms. But this much may be said: *sudden* changes in blood pressure are to be regarded with suspicion and a sudden or comparatively rapid drop particularly is most ominous and frequently precedes a rapidly fatal termination. Let me quote one illustrative case here.

A very heavily built man, aged fifty-six, fell upon his head a considerable distance to the floor of an ice-house and fractured the base of his skull. Admitted to the Western Hospital at 10.30 he had a blood pressure of 178, which by 10.55 had fallen to 154. The cerebro-spinal fluid contained blood, his breathing was getting more laboured and he was becoming rather cyanosed, but he insisted on delaying somewhat the immediate operation that was strongly advised, until other members of his family could arrive. At 11.20 B.P. was 143; at 11.48 (when operation was begun) B.P. 120; at 11.53 B.P. 115; at 12.00 B.P. 108; at 12.03 B.P. 99; 12.10 B.P. 93; 12.13 B.P. 88; 12.16 B.P. 80; 12.19 B.P. 75. Right up to this time pulse and respirations were practically unchanged, about 120 and 24 respectively. At 12.19 B.P. was 75, pulse became uncountable, and respirations ceased suddenly. Three minutes later, under artificial respiration, B.P. was 60. Artificial respiration was kept up nearly three quarters of an hour to no effect.

The *Treatment* of fractures of the skull is essentially a surgical question, and any suggestions I make along these lines are made with proper diffidence; but my colleagues, Dr. England and Dr. Springle, to whom I wish to express my sincere thanks for permitting me to use the large amount of valuable material from their clinics for the purposes of this paper, have given me such excellent opportunity to follow up all these cases to a termination that even one who is not a surgeon may say this much.

Though every case of fracture of the skull does not require operation, every such case requires the closest observation, for developments that will necessitate immediate operation may take place very rapidly. If operation is decided on, it is of no use whatever to explore the wound without opening the skull, and unless the hæmorrhage is entirely extradural (which seems rather rare), it is of very little use to open the skull without opening the dura.

And, if you wish to decompress, take away enough bone to accomplish your object. A trephine opening an inch across will not afford much room for a compressed brain to expand and the brain is much more apt to be damaged by laceration when the opening is small than when it is of ample size. The patient will not die for the lack of two or three square inches of skull, but he may by keeping too much of his skull lose his life.

Cases are well known in which a fractured limb, to which plaster was immediately applied directly to the skin, later swelled up, became gangrenous and required amputation. Is it not possible that, in cases where considerable inflammatory swelling of the brain and its membranes follows the contusion and laceration caused by the injury, non-interference or half interference may result in somewhat the same effect on the cerebral circulation as the plaster had on the circulation in the rapidly swelling leg, the skull splinting the swollen brain as the plaster did the leg? And remember that any considerable increase of the intracranial over the intraspinal pressure is apt to crush the medulla into the foramen magnum like a tight-fitting cork into a bottle. Also, the medulla, containing as it does all the important vital centres, stands such pressure very badly. I well remember an autopsy on one case of fracture of the skull where this jamming of the medulla into the foramen was present to such an extent that the groove made by the ring of bone pressing on the medulla was distinctly visible.

Apart from the danger to life, I have an impression—it is hardly an opinion for which I could quote you convincing reasons—that on the whole, cæteris paribus, cases operated on recover more completely and more rapidly than unoperated cases, and are less likely to have permanent ill-effects, such as epilepsy.

Certainly some cases that for a time apparently do not require operation lapse into such a condition that they must be operated on or die; and occasionally cases occur which one could wish had been operated on, though they were not.

In this connexion, emphasis may be laid upon the frequency with which cases of injury to the cranium supposed to be of a trifling nature have been admitted to the Western Hospital, cases the symptoms of which have become gradually more severe and which would undoubtedly have caused death if operation had not been resorted to in time to save the patient.

One such case that occurred two or three months ago may be briefly quoted. Kept over night in the Out-door department after a fall, this middle-aged woman was taken to the ward because she hardly seemed well enough to send home. Rather dull and stupid, she was thought to be somewhat lacking mentally, and little attention was paid to her. Her dulness increased, however, and when Dr. England's attention was drawn to her two or three days after her admission, upon his return after an absence from town, she was unable even to tell her own name. When I saw her immediately after, she was not unconscious, though she had incontinence of urine and fæces and nothing that was said to her seemed to reach her understanding. She had, I think, a low blood pressure, and blood-stained cerebro-spinal fluid came away under pressure on lumbar puncture. Operation by Dr. England removed a considerable quantity of dark semi-fluid blood from inside the dura and she made a perfect recovery.

Apart from operative measures, the treatment of fractures of the skull from a neurological standpoint is essentially that of concussion. In this respect it is only necessary to emphasize the importance of complete rest and liquid diet for a sufficiently long time.

THE second convocation of the American College of Physicians will take place at the Hotel Nassau, Long Beach, Long Island, on June 5th, 1917. About ninety per cent. of all the Fellows who have not entered on duties connected with the war are expected to be present. About fifty physicians of national repute will be admitted to Fellowship.

THE honour of being the first woman from the overseas Dominions, and the seventh woman in Great Britain, to pass the first part of the examination for the London degree of F.R.C.S. and L.R.C.P., has fallen to Miss Marian Noel Bostock, daughter of Senator Hewitt Bostock, Liberal leader in the Senate. Miss Bostock at present is acting house physician in the Queen's Hospital for Children at Hackney, London.

Editorial

FINCH AND BAINES—A SEVENTEENTH CENTURY FRIENDSHIP*

IT is with great pleasure that we call the attention of the readers of this JOURNAL to a book which has just been issued by the Cambridge University Press. The author is Archibald Malloch, a Graduate in Medicine of McGill in 1913, at present a temporary Captain in the Canadian Army Medical Corps. Letters from Captain Malloch have already appeared in this JOURNAL, both from Dunkirk where he served as Surgeon with the Friends' Ambulance Unit; and afterwards from La Panne where he worked under Dr. Depage. The name Captain Malloch bears is well known in Canada. He represents in his family a second generation of Medicine: and it is to his father, Dr. E. M. Malloch of Hamilton, a pupil and disciple of Lister, that his book is dedicated.

As Captain Malloch himself puts it, "a chance of this War placed me in the summer of 1915 in charge of a small Hospital for Officers at Burley-on-the-Hill in Rutland—" England's smallest county. This was for many years the seat of the Earls of Winchilsea and Nottingham, whose family name was Finch; and here it was that opportunity came to Captain Malloch to collect the material for his record of the past. He tells us of the life-long friendship of Thomas Baines and John Finch, and in telling us of this he tells us also of many other things. Finch and Baines were a kind of David and Jonathan. Neither of them was married; and each gave the other the sort of friendship, the sort of whole-hearted affection, that in our hurried, hustling age seems almost to have disappeared from the earth. In this history there is, as always, other history. In telling us of the friendship Captain Malloch takes us along with him backward to where Science, emerging from its swaddling-clothes, shows itself as an energetic infant, manifests itself as a living growing thing. We are back in the time of the Stuarts, of Oliver Cromwell, of the Restoration.

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*FINCH AND BAINES: A SEVENTEENTH CENTURY FRIENDSHIP. By ARCHIBALD MALLOCH, B.A., M.D., temporary Captain, Canadian Army Medical Corps. Publishers: C. F. Clay, Cambridge University Press. London: Fetter Lane, E. C. Toronto: J. M. Dent & Sons, Ltd. 1917. Price 10|6.

There is some doubt as to the date of the birth of Sir Thomas Baines, the elder of the two friends; but if, as is currently reported, he was born in 1622, then he was born in the same year as Molière, arch-delineator of the Physician and the Scientist—pompous and be-wigged—of his day. Amongst much these same Physicians and Scientists lived Finch and Baines; but as we read Captain Malloch we become aware that to Molière's picture, as to every other picture, there is another side. Sir John Finch and Sir Thomas Baines were be-wigged certainly, but they were neither ignorant nor pompous. They were emphatically human beings, not so very unlike ourselves, eagerly seeking answers to those same questions which are on every side of us to-day—too many even yet unsolved: and as we read we are drawn to these two seventeenth-century men, full to the brim as they were with the modern scientific spirit—the desire to know.

Happily for us Sir John Finch kept a diary. Not the emotional kind of diary kept by eighteenth-century heroes and heroines, but a very concise and practical record of his doings and thinkings. From this and from his letters to his sister—Anne Conway, reputed the most learned of the "female metaphysical writers" of the time, and called by her brother always "dearest Soule" or "dearest Dear"—we can trace, by Captain Malloch's good offices, the every-day life of a man divided from us by three long centuries; and that in the intimate fashion which is the only way worth tracing anything. Captain Malloch indeed, in bringing together these records, enables us to test the truth of Balzac's remark that, when history is written as it ought to be, there will be no need of fiction. Balzac perhaps had in mind the kind of history which Captain Malloch gives us here.

Sir John Finch and Sir Thomas Baines met at Christ's College, Cambridge, and there as students together they formed their life-long friendship. After leaving the University they went abroad together: visited at Paris the "Hostel Dieu" and found it "a famous Hospital but there's eight in a bed"—which gives some ground for Molière's animadversions on the Profession!—and from thence they made their way, by Auxerre, Dijon, Geneva, to Padua. There they worked, studied, and wrote and from there in 1652 Finch began to send to his sister and brother-in-law "Discourses" on philosophical and scientific subjects: a custom he kept up for the rest of his life. He seems to have interested himself in every conceivable thing. He writes of the "Manner by which Trees, Plants and all Vegetables are Nourished"; he writes of the circulation of the blood and ranges himself on the side of Harvey—a connexion by the way of his own—although he persists in retaining relics of the pre-Harveian idea that the blood ebbed and flowed in both the arteries and veins; he discusses the way to make "a choice Coffé for your friends" and the Philosophy of Descartes, and he sends his sister "three of Descartes *Principles*" together with two "Bolognia masty dogges"; he also transcribes a Latin poem by Baines in praise of Molinetti, Professor of Anatomy at Padua. Poems have been written on all kinds of things but "Anatomical dissections publicly performed by Antonio Molinetti of Padua" seems a queer choice for verse! Such a choice, however, did Baines make, and a long Latin poem did he write. "You do not, Molinetti, dissect bodies," he says in the course of it, "but adorn them. You bring them into the Theatre cleansed from all dirt, perfect in limb, and the obedient muscles are freed at your touch; thus you show yourself not an anatomist, but, what is far greater, a god." Walt Whitman himself could not have said more.

The friends lived lives full of recognition. Academic Honours were theirs almost for the asking. Finch in 1660 or thereabouts came under the notice of the Duke of Tuscany and was appointed Professor of Anatomy at Pisa—the first and only Englishman to receive this honour. Later he was appointed Physician to the Queen of England, later still Ambassador to Florence. The friends were knighted one after the other, each received the Degree of Doctor of Physic from Cambridge, and they both interested themselves in the formation of the Royal Society, "a society for promoting experimental philosophy": in 1764 Sir John Finch was sent as Ambassador to the Ottoman Court. All his life Finch knew what it was to have money, power, social recognition: he was emphatically what is called a successful man. His friend accompanied him everywhere, and as life went on these two men seem to have become more and more wrapped up in one another, more and more careless as to the rest of the world. Finch undoubtedly was the David of the alliance, the active energetic partner. "In public," says Captain Malloch, "Finch always appeared as the leader of the two, but to what extent he was indebted to his helpmate Baines, for his success in diplomatic and scientific work, we shall never know." As to Sir Thomas Baines, we hear of him principally as engaging himself in diligent reading and note-taking. He filled the post of Professor of Music at Gresham College for many years, mostly *in absentia*. and though, as his biographer says, "there is no evidence to show that he was qualified to hold any musical professorship at all," hold it and its emoluments he did just as he wrote his Latin poem on dissection. These men lived in a blessed age where Specialism was not!

The book is full of entertaining anecdote. On one occasion while Sir John Finch was Ambassador in Constantinople, the French Ambassador, warmed by wine and like a giant refreshed, was moved, we are told, to relate at lunch some of the incidents of his early life in Paris. Baines, a gentle soul, was much discomposed by these revelations, and, leaning forward, he interrupted them by asking, "Et che dirà il Crucifisso?" Finch, who always took great pride in any observation of his friend, states that the Frenchman was "struck dumbfounded and was filled with astonishment." It cannot but strike *us* that the rest of the lunch must have been somewhat of a strain for all concerned.

In 1681, Sir Thomas Baines died at Constantinople, and Sir John Finch was left alone. "I have lost Sir Thomas Baines," Finch writes, "the best friend the world ever had." David did not long survive Jonathan. Sir John Finch returned home with the body of his friend, and died in the following year at London.

The book is admirably printed on paper that, in these lean days of War, it is a pleasure to touch and handle, and it is full of illustrations, reproductions of portraits of the friends, and of places connected with their lives. Sir John Finch, in his portrait by Carlo Dolci, has all the appearance of the successful man: and evidently he knew what it was to look arrogant. Sir Thomas Baines has by far the more charming face. He has meditative eyes, a gentle expression; and in spite of his habit of asking difficult questions, most surely he was lovable. "I shall live, O beloved," says Sir John Finch in the epitaph he wrote on his friend, "mindful of our Friendship, and no day shall ever remove us from a remembering age."

So ends the story of the friendship between Sir John Finch and Sir Thomas Baines. Captain Malloch tells us that this "pleasant but quite novel task" was undertaken at the suggestion of Sir William Osler. "I owe a great debt of gratitude for his influence, which has been a continual stimulus," says Captain Malloch, and in the concluding sentence of the Preface, he designates Sir William Osler "the young man's friend."

Ability to accomplish work such as the biography of these two friends is given to few of us: to still fewer is given the wish to attempt such a piece of work in the midst of a busy life. Captain Malloch has had the wish, and it is evident that he has enjoyed the work, for his book bears the marks of pleasure in the writing of it—the only real reason for ever writing anything at all. Such an author earns the admiration and gratitude of his readers. This JOURNAL offers Captain Malloch its sincere congratulations.

THE ACTIVITIES OF A PROVINCIAL ASSOCIATION

THE presidential address of the Manitoba Medical Association by Dr. James McKenty, of Winnipeg, put forward a strong plea for support of the Canadian Medical Association and its JOURNAL by the various provinces. The Manitoba Association became affiliated with the Canadian Medical Association in 1912, and since that time the annual fee of $5.00 includes membership in the two Associations and the subscription to the CANADIAN MEDICAL ASSOCIATION JOURNAL. Fifty cents out of every annual fee of five dollars is refunded to the affiliated Provincial Association of the province from which it came. This refund constitutes the only revenue of the Manitoba Association. This year it amounted to $58.00. At present, therefore, there are only 116 out of the 519 resident practitioners in Manitoba who are subscribers to the JOURNAL and members in good standing of the two Associations. It was pointed out that this showing was not creditable to the province, and that a National Association was necessary for the promotion of many of the aims of the profession, and a journal essential to the maintenance of a vigorous association. Such aims as the control of quackery, the patent medicine fraud, and the enactment of legislation relating to public health matters can best be furthered by such an organization. In respect to these matters a great work had been accomplished in the United States by the American Medical Association and its journal. In Canada a similar work was needed, and, in addition, there were already problems arising out of the world war which must be met. The organization for doing this existed in the Canadian Medical Association and its JOURNAL. In order to assist in this work a more loyal support must be extended to the National Association. The JOURNAL was the mouthpiece of the profession in Canada, and on its own merits was worthy of support. He who would keep himself informed regarding the attitude of the profession towards public questions needs the JOURNAL.

A review of Manitoba's contribution to the present great world struggle yielded a creditable showing. Since the beginning of the War the province had contributed for military service 226 graduates in medicine and 113 trained nurses; of these about fifteen of the medical men were on the permanent staff doing duty in the province.

Another matter for consideration was the policy to be adopted towards the claims certain irregular practitioners are now making for legal recognition by the province. The speaker was convinced that a policy of uncompromising opposition would be a mistake. In the first place we could never hope to free the province completely from quackery. The conditions which favour its growth cannot be removed. At best some lessening of the susceptibility of the community could be brought about by a diffusion of knowledge upon matters of health. Something was being done by the Manitoba Board of Health in this direction. Through the agency of specially trained nurses in the employ of the Board, who visit the people in their own homes, "instruction was being given, and practical demonstrations wherever possible, upon all matters relating to the health and care of children, domestic sanitation, and community health." This was a work which ought to receive the cordial support of the profession in Manitoba. Secondly, under democratic government such as was in force there, the jury which finally decides such matters is the general public, and such a jury was known to be utterly incompetent to judge of the merits of such a question.

The spirit of democracy also was opposed to laws limiting the freedom of the individual. The evidence establishing the need for such a law must be amply adequate and readily appreciated by the public in order to secure its enforcement after it has been enacted. Without the support of public opinion it becomes more or less a dead letter. A policy therefore should be adopted that would appeal to the common sense of the average man. It was felt this could be done without impairing the efficiency of the regulation proposed. The people of Manitoba had already sanctioned laws based upon the principle that he who claims to be an expert in repairing the defects of a machine must have an accurate knowledge of its construction and the functions of its various parts. An Act should be framed applying the same principle to the individual claiming to be an expert in repairing the ailments of the human machine so that after he has satisfied the University of Manitoba as to the accuracy of his knowledge in anatomy, chemistry, physiology, pathology, bacteriology and diagnosis he should be permitted to practise the healing art under whatever name he chooses. And while amendments were being made to the Act its prohibitive features should be made more stringent and more comprehensive. This policy would disarm those who have visions of trades unionism and, if adopted, it would protect the community from imposture, in so far as this could be done by legislation. Such a policy has long since rendered homœopathy harmless, and might be relied upon to do the same for osteopathy and all other forms of therapeutic aberration.

It was pointed out that in the Province of Manitoba the authority to issue license to practise, to investigate charges and cancel licenses for cause, and to prosecute illegal practitioners, was vested in the College of Physicians and Surgeons of Manitoba. All of these were surely matters of much interest to the practitioners of the province, yet at the last election for membership in the Council of the College (September, 1916), only eighty out of approximately five hundred votes were cast. This indicated that something was wrong either with the profession or with the College. Was the difficulty a lack of interest on the part of the profession in the matters the College is authorized to deal with? Or was there a lack of confidence in its ability to deal with them successfully? Is the difficulty the annual fee of two dollars which the members must pay in order to vote? Should this fee be made compulsory for a continuation of the license or should it be abolished altogether? It was suggested that each member of the Manitoba Association give this subject some thought and come to the next meeting of the Association prepared to propose some means for increasing the efficiency of the business organization of the profession in Manitoba.

A FEDERAL DEPARTMENT OF PUBLIC HEALTH

WITH commendable persistence and with the courage born of conviction, Dr. Michael Steele, the member for South Perth, on May 2nd, again introduced in the House of Commons the question of the establishment of a Federal Department of Public Health. The importance of the matter has been pointed out over and over again in this JOURNAL, and the lessons we have learnt during the war have made us realize even more acutely than before the failure of our present system of guarding the public health. We live in a new country, in a country that has been developed, and in cities that have grown up, since a knowledge of the laws of hygiene and health were acquired; and yet, out of 407,221 men, of an age when they should be at the height of their physical power, 43,453 were found physically unfit for active service! The war has impressed upon us another lesson which is of particular interest to the medical profession and the Government, and that is the value of health, both from the national and the economic standpoint, and the importance of preserving the life of future citizens who will some day take the place of those who have laid down their lives in the service of their country. In spite of all that has been done hitherto to prevent the spread of such diseases as tuberculosis, how many people die from preventable disease during the course of one year; and how many infants die whose lives might be saved? The success that has attended the measures already taken, and particularly those in force among the troops taking part in the present war, gives us the answer. Again, the war is teaching us a third great lesson, and that is the vast importance of utilizing our resources. The food shortage in Europe is already acute and on this continent the situation is becoming more and more urgent,—and in Canada only about one-tenth of the land area is under cultivation. Our resources, naturally, cannot be developed unless our population is increased and for this we must rely to a large extent upon immigration; it must be, however, the immigration of healthy and efficient individuals and not, as has happened so often in the past, of the inefficient and the feebleminded.

Though at the moment all our energies are centred upon the prosecution of the war and it may be impossible to effect comprehensive and lasting changes until our main object is accomplished, let us look forward to the time when these different matters, all of which exercise so vital an effect upon the public health, shall be coördinated under one efficient department.

AMONG the many honours that have fallen to the lot of Colonel H. S. Birkett, C.B., M.D., none perhaps will be more appreciated by his friends than the compliment recently paid him by the placing of his name upon the Editorial Committee of the *Journal of Laryngology, Rhinology and Otology.* Not only is it a tribute to the professional standing and ability of Colonel Birkett, but a compliment to the medical profession of Canada in that Colonel Birkett is the first Canadian to receive this distinction.

According to the returns tabled in the House of Commons by Sir Edward Kemp, the Minister of Militia, on May 7th, men to the number of 407,221 were enlisted in the Canadian Expeditionary Force up to March 31st, 1917, and out of that number 43,453 were rejected as being medically unfit for active service. The rejections include men who have been incapacitated by wounds and the figures are made up in the following way: men discharged in Canada, exclusive of those who have returned from abroad, 29,658; men who have returned to Canada and have been discharged as medically unfit, 11,917; and those who have been discharged overseas, to the number of 1,478. Thus the percentage of rejections throughout Canada was 24. The figures for the various military districts in the provinces of Ontario and Quebec are given as follows: Military district No. 1 (London), 15,886 men accepted out of 20,544, or 77 per cent.; military district No. 2 (Toronto) 58,086 accepted out of 73,664, or 76 per cent.; military district No. 3 (Kingston-Ottawa), 19,792 accepted out of 28,046, or 68 per cent.; military district No. 4 (Montreal), 11,261 accepted out of 18,050, or 63 per cent.; military district No. 5 (Quebec), 3,292 accepted out of 4,246, or 77 per cent.

Miscellany

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

CLINICAL AND LABORATORY TECHNIC. By H. L. MCNEIL, A.B., M.D., adjunct professor of medicine and instructor in physical diagnosis, University of Texas Medical School, Galveston. With illustrations. Publishers: C. V. Mosby Company, St. Louis, 1916. Price, $1.00.

THE NEWER METHODS OF BLOOD AND URINE CHEMISTRY. By R. B. H. GRADWOHL, M.D., director of the Pasteur Institute of St. Louis; and A. J. BLAIVAS, assistant in the same. 226 pages with sixty-five illustrations and four colour plates. Publishers: C. V. Mosby Company, St. Louis, 1917. Price, $2.50.

PREVENTIVE MEDICINE AND HYGIENE. By MILTON J. ROSENAU, professor of preventive medicine and hygiene, Harvard. With chapters upon SEWAGE AND GARBAGE, by G. C. WHIPPLE; VITAL STATISTICS, by JOHN W. TASK; MENTAL HYGIENE, by T. W. SALMON. Second edition thoroughly revised, 1209 pages. Publishers; D. Appleton & Company, New York and London, 1916. Price, $6.00.

THE DISEASES OF INFANCY AND CHILDHOOD. For the use of Students and Practitioners of Medicine. By L. EMMETT HOLT, M.D., Sc.D., LL.D., professor of diseases of children in the College of Physicians and Surgeons (Columbia University), New York; and JOHN HOWLAND, A.M., M.D., professor of pediatrics in the Johns Hopkins University, Baltimore. Seventh edition, fully revised. 1161 pages with 215 illustrations. Publishers: D. Appleton & Company, New York and London, 1916. Price, $6.00.

Obituary

JOHN L. DAVISON, M.D.

The following appreciation of the late Dr. Davison has been received from Dr. H. B. Anderson, of Toronto:

Dr. John L. Davison, of Toronto, died at the residence of his brother, W. S. Davidson, Esq., in Napanee, on April 20th, 1917, where he had gone to spend the Easter holidays. Dr. Davison had been in indifferent health for some years being a victim of angina pectoris. The immediate cause of his death was pneumonia.

Born in 1853, Dr. Davison was the youngest son of John and Jane (Swanzy) Davison, who came to Canada about 1815 from Co. Antrim, Ireland, and settled at Odessa, Frontenac County. As a boy he attended the public school at Yarker; afterwards he studied at the Newburgh Grammar School and the Toronto Normal School, where he was awarded the McCabe Gold Medal. He was a teacher in the Provincial Model School, Toronto, for ten years, during which time he graduated in Arts in 1880 in the University of Toronto. He then studied Medicine in Trinity Medical College, where he graduated in 1884, afterwards pursuing post-graduate studies in Edinburgh and London, where he took the M.R.C.S. qualification. Returning to Canada he began practice in Toronto in 1885. The same year he was appointed Professor of Pathology in the Women's Medical College, and the following year Professor of Materia Medica and Therapeutics in Trinity Medical College. Appointed visiting physician to the Toronto General Hospital in 1887, he relinquished this post in 1907 in order to facilitate what was considered would be a satisfactory reorganization of the staff of the hospital, and was appointed to the consulting staff. On the federation of Trinity with the University of Toronto in 1902 he became Professor of Clinical Medicine in the latter institution. For many years he was editor of the *Canada Lancet.* On the organization of the Imperial Life Assurance Company he was appointed medical referee; later also he became consulting referee to the Manufacturers Life.

Dr. Davison was a member of the Masonic Order and of the National, Toronto, York and Tadanec clubs. In politics he was a Conservative; in religion a Presbyterian; he never married.

In the death of Dr. Davison the medical profession of Canada has lost one of its most esteemed and distinguished members. After beginning practice in Toronto, he soon became established as one of the best known and highly regarded physicians of the city, and his popularity, not alone with his patients, but with his medical confrères and the public at large, continued to increase until the time of his death. The reasons for his success are not difficult to appreciate. His handsome appearance, distinguished and dignified bearing, his direct, straightforward and honourable attitude toward all with whom he came in contact, his kindly and philosophic outlook on life, were all features of a unique personality which attracted and retained warm friendships. Highly endowed by nature, he had the further advantage of a thorough general and professional education, extended by travel and intercourse with people prominent in social, educational, political, and business affairs.

He was an excellent clinical teacher and lecturer, the breadth and soundness of whose judgement made a deep impression on his students. He was the ideal type of the cultured and skilful family physician, eminently fitted to be "friend, counsellor, and guide" to his large and influential clientèle. It must be rare indeed that one is rewarded with a deeper hold upon the confidence and affection of those to whom he ministers, or who seek advice in their troubles. His friends were legion, and included all ranks and classes of society, —men and women, old and young, rich and poor—all came under the spell of his broad human sympathy, kindliness of heart and sparkling humour. For ten years he lived under the shadow of angina pectoris, which confined his activities within a steadily narrowing sphere, yet, without complaint, he adjusted himself to enforced limitations, which, however, never abated the joy of living. In fact, his last years he repeatedly said were the happiest of his life, his physical disability giving him more leisure for reading, reflection and for music, especially of the violin, at which he passed many pleasant hours with a small set of intimate friends.

He was an expert with rod and gun, and it was exhilarating to watch the boyish enthusiasm with which he prepared for his frequent outings to the Georgian Bay, where he revelled in the beauties of nature in the company of kindred spirits at the Tadenac Club. On hearing of his death, Dr. George T. Elliot of New York, one of his companions of the Tadenac, wrote as follows:

"It was a great shock; it was a terrible sorrow and a deep realization of irreparable loss I experienced and felt when the fact was brought in to me that our dear old friend, the sweetest-natured friend and companion ever, had been called away and had left us behind—yes, to follow him eventually—but still without his company. Alone has he gone from those he loved and who loved him, and it is with deep sadness I am writing you my feelings, knowing how you also were close and dear to him. What a pity he has gone, and how we will miss him—not for a day or a month—but for all the time that still remains to us, his cheeriness, his loveableness, his kindly smile and overbrimming milk of human kindness will be a cherished memory. May God bless him."

In accordance with his wishes and in keeping with his simple tastes, he was buried in the family plot in the pretty cemetery on the banks of the Sydenham River, near the village of Florence, where his boyhood days were spent, and whence a number of his old friends accompanied the remains to pay their last tribute of love and respect.

LIEUTENANT-COLONEL HEWETSON, M.D.

LIEUTENANT-COLONEL SAMUEL W. HEWETSON, C.AM.C., whose death occurred on March 6th, at the Royal Free Hospital, London, after an operation, had been on active service for about a year. In August, 1914, he was in practice at Pincher Creek in Alberta, and upon the declaration of war, immediately offered his services to his country. He was appointed regimental medical officer of a battalion that was going overseas, and later A.D.M.S. of Military District No. 13. He was anxious, however, to get to the front and when the Eighth Field Ambulance was authorized, he was given command of that unit and in due course proceeded overseas. The strain of his military duties told upon him severely and some time ago it was reported that he was suffering from nervous breakdown and shell shock, and later came the report of his death. Lieutenant-Colonel Hewetson was in the forty-ninth year of his age and was unmarried. He had practised for a time at Calgary before going to Pincher Creek, and was a graduate of McGill University of the year 1893.

MAJOR DAVID B. BENTLEY, M.D.

MAJOR BENTLEY, whose death occurred in England early in April, volunteered his services as soon as war had been declared and was appointed to the command of the Fourteenth Field Ambulance.

Some months were spent in training at Valcartier and when the first contingent of the Canadian Expeditionary Force left for England, Major Bentley with his unit accompanied it. After a year's hard service at the front he returned to England and for a time was on duty at Monk's Horton. Later he was appointed to take charge of the medical base hospital depot at Southampton. His health, however, had been seriously undermined while at the front and he never regained his strength. A few months ago he entered the Granville Special Canadian Hospital at Ramsgate and it was there that his death occurred. David Bentley was born in 1864, and took his degree at Trinity Medical College in 1891. He was in practice at Sarnia, Ontario, and was well known as a physician throughout the western part of the province, where he was also district medical officer of health. He leaves a widow and two sons, both of whom are on active service.

Dr. Thomas Sparks, of St. Mary's, Ontario, died on April 10th, after a long illness. He was a graduate of the University of Toronto, where he took his medical degree in 1867, and practised for some years at Lakeside, in the province of Ontario. From Lakeside he went to St. Mary's about twenty-five years ago and continued to practise until about five years ago. His son, Captain G. Lindsay Sparks, C.A.M.C., of London, Ontario, is on active service.

Dr. Henry James Fixott, who died on April 11th, was in the seventy-third year of his age and had been in practice at Arichat, Nova Scotia, for almost fifty years. Dr. Fixott came of an old Jersey Island family, his father and grandfather before him being of the medical profession and the latter serving at one time as surgeon in the British Army. He graduated from the Harvard Medical School in 1866.

Dr. Wallace G. King, of Buctouche, New Brunswick, died suddenly on April 21st. He had been in poor health for some time, but seemed to be improving and had resumed work, and it was upon his return from visiting a patient that he suddenly expired. Dr. King had been in practice at Woodstock for thirty-two years and will be greatly missed by his patients, to whom he had endeared himself by his unselfishness and devotion to duty. He was sixty-seven years of age and is survived by a widow, three sons and three daughters.

Dr. James A. Ross, of Barrie, Ontario, died on May 1st, in the fifty-second year of his age. He was born in Oro Township the son of the late James Ross, at one time Warden of the County, and received his medical degree from the University of Toronto. He completed his medical studies at Edinburgh and Glasgow and upon his return to Canada took up practice as an eye, ear, nose and throat specialist. He had practised at Barrie since 1895, but for the past twelve months had been in poor health. He never married. His brother, Captain W. A. Ross, C.A.M.C., is at present in France and another brother, Captain Victor Ross, C.A.M.C., was sanitary officer at Niagara Camp last year.

Dr. John Buchanan Wilson, who died at Ottumwa, Iowa, on April 20th, was a Canadian by birth and a graduate of the University of Toronto.

Dr. H. E. Hammill, of Assiniboia, died suddenly at Weyburn on Saturday, April 14th. Dr. Hammill was the son of Mr. J. D. Hammill, mayor and postmaster at Meaford, Ontario. He was in practice at Assiniboia and was about thirty-two years of age. He leaves a widow.

Dr. Neil Roy Stewart, who also died suddenly at Weyburn on April 14th, was in practice at East End, Saskatchewan, until a short time ago when he was appointed medical officer of the 249th Battalion. He subsequently severed his connexion with the battalion, however. Dr. Stewart was born in 1889 and graduated from the University of Manitoba in 1914.

Dr. E. L. Graves died at Mount Bridges, Ontario, on March 5th, of pulmonary tuberculosis. Dr. Graves received his degree from Western University Medical School in 1914.

News

ONTARIO

Dr. M. F. E. Graham, who has been assistant physician in charge of the women's wards at the Eastern Hospital for the Insane at Brockville for the past two years, has been appointed resident physician of the Jubilee Hospital at Victoria, British Columbia.

The members of the Separate School Board, Toronto, at a recent meeting, unanimously decided to ask Dr. Hasting to undertake the medical inspection of children attending schools under the jurisdiction of the Board. In future therefore, pupils in attendance at school in Toronto—whether Protestant or Catholic—will be subject to medical examination under the direction of the Board of Health.

Dr. E. C. Axford, formerly of Ripley, has gone into practice at Alvinston.

QUEBEC

The annual meeting of the Alexandra Hospital, Montreal, took place on April 20th, when the report for 1916 was submitted by the president, Sir Thomas Roddick. During the year 973 patients were treated in the hospital, including 347 cases of diphtheria, 317 cases of measles, 48 cases of erysipelas, and 38 cases of poliomyelitis; 53 deaths occurred, 35 of them taking place within forty-eight hours of admission.

ALBERTA

The plans for an addition to the Ponoka Asylum are in course of preparation.

It is the intention shortly to open a hospital at Fort McMurray.

The Holy Cross Hospital at Calgary is to be enlarged.

SASKATCHEWAN

It was decided at a meeting of the Saskatchewan Hospital Board, which took place on May 2nd, that alterations and improvements should be made to the General Hospital and that an isolation hospital should be erected to replace the shacks now in use for cases of infectious disease.

MEDICAL COLLEGES

Toronto University

A SPECIAL convocation was held at the University of Toronto on May 2nd, on which occasion degrees in medicine were conferred upon students to the number of thirty-two, many of whom had already been on active service and had returned to complete their course in medicine. The recipients of the degree of M.B. were: York Blayney, B.A.; James S. Crawford; Nicholson W. Furey, Henry R. Hargrave, James H. Howell, B.A.; Harold J. Irvine, Cecil O. Miller, Wm. T. B. Mitchell; A. E. Mackenzie; John W. Mackenzie, Charles Russell MacTavish, H. C. Nash, Harry A. Rawlings, J. Whittier Reddick, C. V. Scott, B.A., Percy R. Shannon, Frank R. Smith, Geo. F. Skyes, Elfred C. Tate and Charles A. Wells. Degrees were conferred in absentia on: Ruth C. Cale, B.A.; Mary E. D. Johnston, E. G. Berry, A. J. Butler, C. K. Fuller, B.A.; J. A. R. Glancy, W. Hall, B.A.; Robert Morley Harvie, George D. Jeffs, B.A.; J. L. King, F. W. Leech, and B. S. Loney.

McGill University

THE annual convocation took place at McGill University on May 11th, when the degrees of M.D., C.M., were conferred upon the following gentlemen, sixteen in number. G. W. Bissett, Vancouver Island, British Columbia; A. N. Chisholm, Port Hastings, Cape Breton; H. A. DesBrisay, Shaughnessy Heights, Vancouver; A. C. Farlinger, B.A., Ft. Covington, New York; H. L. Gokey, South Hammond, New York; J. P. Hadfield, Fall River, Massachusetts; R. S. Hall, Jamaica; J. F. Haszard, Charlottetown; W. A. Hunter, Huntingdon, Quebec; A. F. McGregor, New Glasgow, Nova Scotia; A. P. Murtagh, Ottawa; W. S. Parsons, Montreal; E. E. Rogers, Vancouver; B. W. Skinner, Weston, Nova Scotia; L. J. Stuart, Brantford, Ontario; C. G. Sutherland, New Glasgow, Nova Scotia.

The candidates have already seen active service but returned to Canada to complete their studies. It is now their intention as qualified practitioners to offer themselves to the C.A.M.C. for further service at the front.

The prizes awarded for the session 1916-17 were:

THE HOLMES GOLD MEDAL, for highest aggregate in all subjects forming the Medical Curriculum: H. A. DesBrisay, Vancouver.

*Final Prize for highest aggregate in the Fifth Year Subjects: O .V. Marsh, Jamaica, B.W.I.

*Wood Gold Medal for best examination in all the Clinical branches: T. M. Richardson, B.A., Balderson, Ontario.

*These candidates received their degrees in February, 1917.

Dalhousie University

The annual convocation at Dalhousie University was held on May 10th, in the Library Hall, Studley, Halifax.

The following seven candidates received the degrees of M.D., C.M.: Thomas Roland Dwyer, Holyrood, Newfoundland; Roy Dickson Lindsay, Halifax; Joseph Percy Macgrath, Tusket, Nova Scotia; Philip Doane McLaren, Halifax; Thadeus Sieniewicz, Fairview, Nova Scotia; Solomon Jacob Turel, Halifax; Andrew Fraser Weir, New Glasgow, Nova Scotia.

It is probable that several of the graduates will join the C.A.M.C.

ARMY MEDICAL SERVICES

Among the Canadians recently decorated by the French War Office for distinguished and conspicuous services in France were the following members of the Canadian Army Medical Corps:

Croix de Chevalier. **Lieutenant-Colonel Arthur Mignault**, of Montreal.

Croix de Guerre. **Captain Arthur Chester Armstrong**, of Alexander, Manitoba.

The following appointments in the Canadian Army Medical Corps were gazetted on April 28th, last.

Lieutenant-Colonels to be temporary Colonels: Kenneth Cameron, D. O. McPherson, F. G. Finley, W. L. Watt, R. D. Rudolf, C. F. Wylde, L. M. Simpson.

Lieutenant-Colonels to be temporary Colonels: F. Etherington as officer commanding Canadian General Hospital in France; J. D. Courtenay as officer commanding Canadian Special Eye and Ear Hospital; E. C. Hart as officer commanding General Hospital; W. W. Nasmyth.

Majors to be temporary Lieutenant-Colonels: E. R. Brown, R. Raikes, H. C. S. Elliott, A. J. Mackenzie, D. A. Clark, C. E. Doherty, R. A. Bowie, F. Guest, E. S. Ryerson.

Majors to be temporary Lieutenant-Colonels while so employed: D. P. Kappelle as officer commanding Canadian Cavalry Field Ambulance; J. A. Amyot, consultant in sanitation; T. A. Starkey, sanitation officer; R. Wilson, consultant x-ray medical electricity; L. E. W. Irving, officer commanding Canadian Convalescent Hospital.

Captains to be temporary Majors: J. T. Hill, W. H. Tytler, W. Bethune, J. D. Morgan, R. H. Sutherland, G. H. R. Gibson, H. E. MacDermot, S. Ellis, G. W. O. Dowsley, J. C. Calhoun, F. A. C. Scrimger, R. H. McGibbon, C. R. Graham, A. K. Haywood, W. A. G. Bauld, J. G. W. Johnson, F. H. Mackay, C. H. Robson, D. E. Robertson.

Other promotions are: To be Lieutenant-Colonel: Major J. J. Fraser, of Walkerton, Ontario, officer commanding No. 2. Field Ambulance, C.E.F.

CAPTAIN G. RUSSELL REID, C.A.M.C., Toronto, has been appointed medical officer of the 253rd Battalion.

COLONEL J. A. ROBERTS, C.A.M.C., who has been in command of the Duchess of Connaught Canadian Red Cross at Cliveden, has been appointed to the command of the Canadian Hospital at Basingstoke.

COLONEL W. L. WATT, C.A.M.C., of Winnipeg, is now in command of the Cliveden Hospital and Lieutenant-Colonel J. McCombe, C.A.M.C., has been appointed A.D.M.S. Canadians at London.

LIEUTENANT-COLONEL H. E. MUNROE, C.A.M.C., has been appointed to the command of the Canadian Military Hospital at Hastings. Colonel Munro, as will be remembered, has been in command of No. 8 Stationary Hospital, which was mobilized under his direction.

LIEUTENANT-COLONEL E. S. Ryerson, C.A.M.C., has been appointed A.D.M.S., of the Toronto Military District in succession to Colonel Marlow.

MAJOR S. A. SMITH, D.S.O., has resigned his commission in the C.A.M.C. in order to accept an appointment in the R.A.M.C.

THE Royal Red Cross of the first class has been awarded by His Majesty the King to Miss Elizabeth Russell, matron of the Duchess of Connaught Canadian Red Cross Hospital at Cliveden. Miss Russell is a daughter of Dr. James Russell, of Hamilton.

THE Royal Red Cross of the second class has been awarded by His Majesty to Nursing Sister Helena MacLaughlin and Nursing Sister Isobella D. Strathy.

MAJOR D. A. CLARK, C.A.M.C., of Toronto, who has been attached to Canadian medical headquarters at London, is now A.D.M.S. Canadians, at Bramshott. Colonel Bridges, C.A.M.C., has left Bramshott and is now A.D.M.S. at Shorncliffe, in succession to Colonel Rennie who is returning to Canada.

THE following physicians recently completed a course in military training at Vancouver and a number of them have volunteered for service with the Canadian Army Medical Corps: Drs. T. A. Wilson, D. J. Bell, J. H. Carson, Corry R. McKenzie, N. Allen, W. E. Newcombe, Bagnall, D. A. Thompsett, O. S. Large, W. A. McTavish, J. J. Mason, S. Harvey, J. W. Ford, Ernest P. Fewster, W. B. Burnett, J. Gillespie, W. L. Coulthard, E. Bolton, J. Mair Robertson.

CASUALTIES

Died on Service

LIEUTENANT - COLONEL SAMUEL WILLIAM HEWETSON, C.A.M.C.

CAPTAIN ADAM PEDEN CHALMERS, C.A.M.C., of Toronto, died May 26th, in Bermuda.

Wounded

COLONEL J. J. FRASER, C.A.M.C., of Walkerton, Ontario.

MAJOR G. J. BOYCE, C.A.M.C.

CAPTAIN R. J. GARDINER, C.A.M.C.

CAPTAIN G. R. JOHNSON, C.A.M.C.

CAPTAIN A. H. WALLACE, C.A.M.C., of Chilliwack, British Columbia.

LIEUTENANT R. S. STONE, C.A.M.C., of Chatham, Ontario.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Canada Lancet, March, 1917:

The importance of renal functional tests in surgery	C. H. Hair.
Enucleation of the eyeball	E. A. Hall.

Le Bulletin Médical de Québec, March, 1917:

Deuxième promenade mélancholique à travers les cimetières de Québec	E. Nadeau.

L'Union Médicale du Canada, March, 1917:

Observations cliniques. Complications cardio-arterielles au cours de la fièvre typhoide—pneumonie et pression arterielle	J. E. Dubé.
Contusion du rein	B. G. Bourgeois.
Cours de therapeutique appliquée à la Faculté dé Médecine Laval, Montréal. Le régime alimentaire dans les maladies organiques	D. Masson.
Etiologie de la fièvre typhoide. Les porteurs de germes	C. E. Dubuc.

The Western Medical News, January, 1917:

Syphilis and general practice	V. E. Black.
Oblique inguinal hernia in infants	W. A. Robertson.

The Public Health Journal, March, 1917:

The value of milk depots	J. Tessier.
Meningococcus meningitis	J. G. Fitzgerald.
Modern conceptions of fumigation after communicable diseases	F. Adams.
The economic value of preventive medicine	J. O. McCarthy.

Medical Societies

NEW BRUNSWICK COUNCIL OF PHYSICIANS AND SURGEONS

The annual meeting of the Council of Physicians and Surgeons of New Brunswick was held in Fredericton on April 19th, 1917. Those present were: T. F. Sprague, M.D., Woodstock; J. D. Lawson, M.D., St. Stephen; S. C. Murray, M.D., Albert; Thomas Walker, M.D., St. John; W. W. White, M.D., St. John; A. F. Emery, M.D., St. John; L. M. Curren, M.D., St. John; G. C. Van Wart, M.D., Fredericton; John S. Bentley, M.D. (the Registrar), St. John.

The following officers were elected for the ensuing year: president, L. M. Curren, M.D., St. John; treasurer, A. F. Emery, M.D., St. John; registrar, John S. Bentley, M.D., St. John.

The professional examiners and various committees were appointed. The professional examinations will be held in St. John twice each year commencing on the fourth Wednesday in June and on the fourth Wednesday in January. Much business of a routine nature was transacted. The next meeting of the council will be held at St. John in July, when the New Brunswick Medical Society will be in session.

TORONTO ACADEMY OF MEDICINE

At the annual meeting of the Academy of Medicine, which was held in the Academy Building, 13 Queen's Park, Toronto, on May 10th, the following officers and members of Council were elected for the session of 1917-18: President, Dr. D. J. Gibb Wishart; vice-president, Dr. A. Primrose; honorary secretary, Dr. J. H. Elliott; honorary treasurer, Dr. J. H. McConnell; past president, Dr. John Ferguson. Chairmen of sections—Medicine, Dr. G. W. Ross; Surgery, Dr. W. A. Cerswell; Pathology, Dr. F. W. Rolph; State Medicine, Dr. Gordon Bates; Ophthalmology and Oto-Laryngology, Dr. F. C. Trebilcock; Pediatrics, Dr. George E. Smith; Drs. A. H. Perfect, H. B. Anderson, F. N. G. Starr, J. G. Fitzgerald, Wm. Goldie, C. P. Lusk, W. A. Young and B. P. Watson.

PETERBOROUGH MEDICAL SOCIETY

A MEETING of the Peterborough Medical Society was held on March 22nd, with a large number of members present, not only the city but the surrounding towns being well represented. On this occasion the paper of the evening, on Pyelitis, was given by Dr. Fraser, of Montreal. After the discussion which followed, Drs. Cameron and Gallivan, on moving a hearty vote of thanks, paid a warm tribute to Dr. Fraser on the excellent manner in which he had treated his subject and said it was with great pleasure that the Society had welcomed one from their own county, who was making a name for himself in the medical world.

THE MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE eighth regular meeting of the Society was held in the Montreal General Hospital on Friday, January 19th, 1917. The meeting took the form of a clinical evening, the members of the Society being the guests of the Medical Board of the Hospital. After the programme refreshments were served; there were ninety-eight members present.

PROGRAMME

PART I.—CLINICAL CASES

(Surgical Amphitheatre)

1. "Recurring intestinal obstruction," Dr. Hill.
2. (a) "Vaquez's disease;" (b) "Tumour of the liver," Dr. Lafleur.
3. "Charts from cases of transfusion," Dr. Henry.
4. "The galvano-cautery in the treatment of larnygeal tuberculosis," Dr. Craig.
5. "Tumour of the mouth," Dr. Hamilton.
6. (a) "Coxa vara and valga;" (b) End results of operations upon the carpal bones," Dr. Nutter.
7. "Selected skiagrams," Dr. Wilkins.
8. (a) "Sarcoma of the kidney;" (b) "Tuberculosis of the ilio-cæcal region," (c) Regeneration of shaft of femur," Dr. Barlow.
9. (a) "Traumatic epilepsy;" (b) "Imperforate anus;" (c) Bone graft of humerus;" (d) "Pressure upon trachea by enlarged thyroid. Child of eight years," Dr. Pennoyer.
10. (a) "Graves' disease without enlargement of the thyroid gland;" (b) "Concealed tuberculosis;" Dr. Gordon.

11. (a) "Actinomycosis." (b) "Results of polor ligation and partial excision of thyroid in Graves' disease," Dr. von Eberts.

12. (a) "Vesical calculus in a child three and a half years old;" (b) "Pyonephrosis vesical fistula," Dr. Powell.

13. "Differential diagnosis between tic and chorea," Dr. Shirres.

14. (a) "Evulsion of tubercle of tibia;" (b) "Gunshot injury of humerus," Dr. Smythe.

PART II.—DEMONSTRATIONS

1. *X*-ray department." Dr. Wilkins.

2. "Series of eye cases. No. V. operating room." Dr. Mathewson.

3. "Pathological specimens. Governors' Hall." Dr. Scott.

THE ninth regular meeting of the Society was held Friday, February 2nd, 1917, Dr. W. S. Morrow, president in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. Horst Oertel.

These specimens are from an interesting and unusual case of lymphatic leukæmia in the service of Dr. Martin. The patient was a girl of eight years, admitted to the hospital on November 15th and died January 29th, so that the course of the disease was a short one. She had sought admission for cough, pain in the stomach and enlarged glands and the disease is said to have commenced six weeks before admission and five days after tonsillitis. Then the right parotid gland began to swell, followed by swelling of the left and of the submaxillary glands. One week later a cough developed and sputum appeared after a few days; she had chills and night sweats but had not lost weight or colour. Femoral glands also became enlarged.

Physical examination on admission to the Royal Victoria Hospital showed general glandular enlargement, but no increase in size of spleen. Blood pressure, 115 systolic and 80 diastolic. Liver palpable. Urine pale, amber, acid, sp. gr. 1020. The blood examination was interesting from the start: after admission, on November 16th, the red blood cells were 2,400,000, whites 27,400 and hæmoglobin 54 per cent. The red blood cells decreased quite rapidly so that at the end of January, shortly before death, they had dropped to 690,000; hæmoglobin to 18 per cent., a severe anæmia; while throughout there was a corresponding increase in lymphocytes, from 27,400 to 201,000. The increase in lymphocytes was almost entirely on the part of typical, small lymphocytes, so that here we have a rather exceptional picture of acute lymphatic leukæmia in which the increase in white blood cells is due to small typical lymphocytes, as contrasted with the usual acute lymphatic leukæmia, in which the prevailing leucocytes are of the large lymphoblastic or myeloblastic types. The polymorphonuclears at the beginning were only 12 per cent., the small lymphocytes, 57½ per cent.; later the polymorphonuclears dropped to 4 per cent., while the small lymphocytes rose to 82 per cent., transitional 2 per cent., undetermined 8 per cent., myelocytes about 2 per cent. So that we can, perhaps, speak in this case, following Leube's terminology, of a leukanæmia.

Autopsy disclosed several additional interesting facts. In the first place there existed a general, very marked, lymphoid hyperplasia in conformity with the usual anatomical findings of the lymphatic leukæmias. The lymph glands are markedly enlarged but are discrete and remain individual; the gross character of the lymph glands varies; the peribronchial glands are very pulpous, splenic, while the enlarged lymph glands of the mesentery and other parts are white, firm, and pale. Similar to those of the peribronchial variety are those in the mediastinal region.

The spleen on the other hand is small and shows very limited lymphoid hyperplasia which impresses one more as infiltrative in character. It seems that here the spleen has not taken an essential part in the formation of lymphoid cells. The thymus is well preserved, large, extremely firm, solid and well outlined, and microscopically shows its tissue almost entirely replaced by what appears to be lymphoid infiltration, so much so that it is difficult to find any thymus structure at all.

The bone marrow was distinctly reddish at autopsy and showed, microscopically, overgrowth of well-differentiated lymphoid cells, mostly small; very few myelocytes, great loss of red blood cells, but hardly any new red blood formation.

The last point of interest is the condition of the kidney. It is well known that in all leukæmias there is leucoblastic infiltration into the kidney. In this case it is so to a most extraordinary degree. This kidney weighs over 400 grams, which would be, even for an adult, a kidney of considerable size and weight. It is uniformly enlarged, bulging, perfectly smooth, pale white, with distinct hæmorrhagic areas and streaks, mottled. Microscopic sections show very diffuse and extensive infiltration by lymphocytes so great that in certain parts medulla and cortex have been almost entirely obliterated and the kidney substance looks entirely like lymphoid tissue.

For some time a discussion has been going on whether the lymphoid nodules and infiltration which occur in leukæmias are really true infiltrations or local lymphoblastic or myeloblastic foci. I think in these it is safe to assume that the largest number of cells are directly derived from the blood; one can see them early, perivascular in origin, and from these places they infiltrate into the tissue spaces and into the surrounding substance, primarily between the tubules, and ultimately replace them. The liver shows much smaller foci.

DISCUSSION: Dr. F. M. Fry: I saw the leukæmic case in my office some weeks before admission (sent to me by Dr. Viner) and advised that she be brought to hospital for further study. The child presented then a most striking enlargement of the salivary glands and she was anæmic and seemed to have all the symptoms described by Mikulicz years ago. It is known that these cases show a pseudo-leukæmia which later progresses to a true leukæmia that proves fatal, as in this child.

Dr. C. F. Martin: One very interesting feature about this case was that five days before the onset of symptoms there had been a tonsillectomy which naturally associates the disease with the idea of an infection. In the early stage of the disease there was not much lymphocytosis. We made a temporary diagnosis of general enlargement of the parotid glands and cervicals of infectious origin. The fact that the condition was of long standing excluded more or less the diagnosis of mumps. We then discussed Mikulicz's disease but the absence of any condition around the lacrymal glands seemed not to confirm it, while the leukæmia developing, whether on a Mikulicz disease or not I cannot say, settled the matter.

Dr. W. F. Hamilton: I remember distinctly a case under my observation several years ago in which the spleen was greatly increased and the liver as well. A leucocyte count of 6,000 with a variety of cells corresponding to myelogenous spleno-leukæmia. The man was forty years of age. It was reported by me as a case of Leube's leukanæmia. I would like to ask if the leukanæmia is not a type distinct from leukæmia.

Dr. Horst Oertel: With regard to Dr. Hamilton's question I am quite willing to admit that my use of the term leukanæmia does not exactly correspond to what Leube originally described, because in his first case, to which he applied the term, there existed, as Dr. Hamilton has pointed out, a blood picture of a pernicious anæmia with only a moderate increase of leucocytes, but great relative increase of mononuclears. In this case, while the anæmia was very grave, the blood picture was not strictly that of a pernicious anæmia and the white cell increase was distinctly leukæmia in quantity and quality. However, later reports have included in the group of leukanæmia all those profound blood alterations which show marked changes in the formation of red as well as white cells and in this sense, I believe, the term is applicable to this case.

PHOTOGRAPHIC DEMONSTRATION: By Dr. G. Gordon Campbell, showing a series of common skin diseases.

PAPER: The paper of the evening was read by Dr. E. H. Mason on the clinical application of functional diagnosis in nephritis.

DISCUSSION: Dr. C. F. Martin: I would like, first of all, to express my appreciation of the work Dr. Mason has put before the Society to-night. Having followed a good deal of this work for the past year or so, I have been able to see the exactness with which he has carried it out. A feature which interests us here to-night in connexion with this work is the demonstration that our older ideas about the anatomical and clinical classifications of kidney disease rather tend to be brushed aside. It is kidney *function* which gives the best idea of what the real state of the kidney is. I recall the frequency with which patients suddenly developed very serious kidney conditions when the ordinary tests that we adopted were negative, or almost negative. Pregnant women whose urine showed little or no evidence of albumin or other sign of disease, would no doubt by a functional test have given a different picture. We recognize pretty well that the mere presence of albumin in the urine and the mere taking of specific gravity once or twice amounts to nothing and tells little of what the kidney really can do. On the other hand we recognize that these tests can only be done with more or less training. Dr. Mason has told us to-night two facts: (1) that by simple measures we can estimate prognosis, and (2) that it is of great importance to study the nightly output from the kidneys and the decimal variations of the specific gravity. As to either the fallacy or correctness of Dr. Mason's observations it seems to me that the very constancy with which the results came out is sufficient to plead for their accuracy. The interesting fact that from day to day the observations that have been made have proved accurate, would go to show that evidently we have a great deal to look forward to in the usefulness of this test, and Dr. Mason is to be congratulated not only on the contents of his paper but on the way in which it has been delivered.

Dr. A. G. Morphy: One striking feature of this paper is the fact that the amount of the excretion of albumin by the kidneys in cases of nephritis is hardly mentioned. I would like to ask Dr. Mason whether he has been able to establish any relation between the amount of albumin excreted by the kidneys and the nitrogen tests which he employs. It really has a practical application. For instance, Dr. Mason says that in cases of passive congestion there is very little trouble with the excretion of urea, etc.; supposing he had a case of passive congestion with a leakage of albumin by the kidney, what practical application would that have upon the diet of the patient?

Dr. M. Lauterman: Dr. Mason's splendid paper recalls some work I undertook while a house surgeon at the Montreal Maternity Hospital some twenty odd years ago. He has established from proven facts theories which I then held, though unfortunately I was unable to go on with the work and prove my views. The first thing I would like to take issue on with Dr. Mason is the importance of the phthalein test: he states that the phthalein indication alone is of no value. As one who has done considerable surgery in connexion with the urological organs, I feel that this test alone is probably the best the surgeon has of his patient's ability to stand surgical interference. I do not mean to imply that the other valuable data to be acquired by the different tests Dr. Mason has outlined are not of value, I think they are probably of more value to the internist than to the surgeon, but in my opinion, and certainly from my experience, this phthalein test is the outstanding test of value as an index in surgical work. In my own limited experience I have classified these tests into two groups for my work, first the excretory, then the retention group. I believe with Dr. Mason that it requires a great deal of work and training and is beyond the average man, but that it is important is apparent not only to the average man but to every one of us who have heard this paper to-night and I am sure the development of this work will not only mark an epoch in this field but we shall be in a position to appreciate more fully the work that is being quietly done in our midst by careful and conscientious observers.

Dr. W. S. Morrow: I would like to express my personal appreciation of this paper to-night as this seems to me one of the subjects in which our knowledge has undergone a great deal of development lately and I would like to ask Dr. Mason, first, whether he often found any great amount of chlorine retention without its giving some clinical indication in the way of œdema, and secondly, whether he found any serious degree of nitrogen retention without showing a drop in the total quantity.

Dr. E. H. Mason: As regards Dr. Morphy's question about the albumin I cannot say that I have found any relation at all between the function of the kidney and the amount of albumin in the urine. One might expect that those cases which have a large amount of albumin would show impaired urea excretion, but that is not so. A great many of our cases are purely chloride ones and have enormous amounts of albumin. If we cut down their protein intake there is the question whether the excretion of albumin would not decrease more rapidly than it would if we kept up a high proteid intake. But I have not found any relation between the various functions of the kidney and the amount of albumin excreted. As regards the dieting in passive congestion of the kidney, I think that the presence of albumin in the urine in passive congestion of the kidney would not to my mind make any difference at all as regards the diet. The fluid and the salt are the two things which need to be restricted, as these patients are often loaded up with fluid. I do not think the protein intake would influence the function to any appreciable extent unless a great deal was given. Epstein says that in chronic parenchymatous nephritis he does not cut down the protein intake at all; just the salt and fluid. As regards the question of the phthalein test, I spoke of this as of not much use alone, that is from the medical point of view; it is of value from the surgical. It is a test of the total kidney function, but it does not show whether the kidney can handle urea or chlorides. The phthalein is no index at all of what the disturbance is in the kidney, it just gives you the total kidney function, and from the surgical point of view that is the main thing. From the point of view of treatment it fails to tell anything as regards the necessity of cutting down the proteid, the salt, or the fluid in the diet. As regards Dr. Morrow's question, I think that in a general way you will find a disturbance of the chlorine metabolism associated with œdema. When you have œdema you almost always have a raised threshold which means damming back of salt within the body and most of the cases under our notice that have had chlorine retention have had œdema.

The tenth regular meeting of the Society was held Friday, February 16th, 1917, Dr. W. S. Morrow, president, in the chair.

Living Case: Glioma of the frontal lobe. The result of decompression, by Dr. G. S. Mundie.

The patient is a man of forty-four years, an overseer in a cotton mill. He was admitted to the Royal Victoria Hospital on November 6th, 1916, complaining of headache and attacks of hiccough. His illness began in March with headaches in the frontal region, in August he started vomiting, chiefly in the morning and of a projectile nature with no relation to food and no pain. Was in the Montreal General Hospital for seven weeks and there it was discovered that he had a marked optic neuritis on both sides. While there, he also developed incontinence of urine and fæces. The only other thing in the history is that one day while walking out he developed a paresis of his left leg, but this passed off in a short time. There was nothing in the family or personal history.

On admission to the Royal Victoria Hospital there was double optic neuritis with hæmorrhages into the retina; the other cranial nerves were negative. There was some indefinite involvement of the sensory system but nothing marked; no involvement of the motor system. The reflexes were increased on both sides, on the right more than on the left; there was incontinence of urine and fæces. There was a double ankle clonus, more marked on the right side; a questionable Babinski on the right side but definite on the left; no Oppenheim, no Gordon, no disturbance of joint sense. Slight incoördination of left side; on walking the patient has a tendency to fall to the right and backward. He would answer questions after two or three minutes and when asked to explain why he did not answer at once, he said he could not collect his thoughts.

On December 4th, the patient was in considerable distress, with marked pain in the head. Examination showed right ptosis, the right pupil dilated, active to light, and there was a slight lateral nystagmus. We were unable to get him to move the eyes; the left showed an external squint. Knee jerks increased on the right more than left; no Babinski on right side and a questionable on the left; there was a considerable paresis on the left side of the face. Another interesting thing was the fact that he had hallucinations, he definitely saw himself in a hippodrome in England and saw two Russians who were torturing him, and he went through other hallucinations. The question arose whether we had a cerebellar or a frontal lobe tumour to deal with. In his walking he deviated to the right, on the other hand he had this marked mental deterioration which pointed to a frontal lobe tumour. At first we were unable to decide on which side but what helped us eventually was the right ptosis and the left external squint. The man was gradually getting worse and we decided to operate. He was taken to the operating room and operated on in the right frontal lobe; the scar is quite marked here. The bone flap was turned down and there was marked tension of the brain which protruded at once. On opening the dura nothing but marked tension was noticed. The osteoplastic flap was turned down and the bone broken across. Dr. Archibald's report is as follows:

Brain very tense before dura opened, very slight pulsation. Posterior area uncovered was normal, but anteriorly the brain was congested and felt very soft; about one ounce of straw-coloured fluid was evacuated. A diagnosis of glioma was made and the dura was left open and the bone loosely replaced.

At first there was marked hernia, which has gradually disappeared and the man to-day says he is quite well. The bone is quite movable. The report when he was examined about a week ago showed: osteoplastic flap pushed out considerably so as to make right temporal region prominent; no bony union. General condition is very much improved; memory has improved so that his wife says it is normal; speech is normal and fluent, but patient is inclined to make jokes. Nystagmoid jerking on looking to right; paralysis of lower left facial muscles; tongue protruded slightly to left; left grip is much weaker than right. No incoördination, no weakness in legs. Reflexes are normal. Slight blurring of both optic discs, especially on nasal side, and a few comparatively recent retinal hæmorrhages.

The remarkable part of the story is the condition of the patient. He says he is practically well and able to go back to work. His memory has cleared up but on examination there is still slow cerebration, he does not execute demands as a normal person would.

The pathological report was, vascular cellular glioma.

The question arises here whether the decompression operation does any good or not and the case was presented to show that you do get more or less good results. As regards the future the outlook is not good but you have given the man anywhere from six months to a year of at least comfort.

Pathological Specimens: Series by Dr. W. J. Scott.

1. Specimens from a case of acute pancreatic disease.

2. Specimen of heart showing numerous lacerations, though there had been no fracture of ribs, from a delirious patient who fell from a window to the street, four storeys below.

Paper: "Fractures of the skull" was the subject taken up for the paper of the evening. Dr. J. Anderson Springle discussed the subject from the surgical point of view while Dr. G. D. Robins took up the neurological aspect.

Discussion: Dr. A. E. Garrow: The Society is indeed indebted to the readers of these papers for a discussion on this very important subject, and more particularly for the list of aphorisms which Dr. Robins has referred to in the treatment of these acute conditions of the skull, to which I most heartily subscribe. I do not know that I am quite prepared to go the full length that Dr. Springle has gone for, as Dr. Robins has pointed out, there are really two types of cases which demand operative interference and decompression —at least operative interference in order to procure less pressure within the cranium. Those of epidural hæmorrhage due to rupture of the middle meningeal in which there is a gradually increasing engorgement of vessels certainly require decompression inasmuch as they require removal of bone and consequently removal of blood clot. Then those cases in which we have evidence of subdural hæmorrhage, as shown by blood in the cerebrospinal fluid with early evidence of concussion, with a certain amount of irritability and the gradual spread of œdema, are the cases in which some interference is called for. With opening of the dura in order to remove distension good results should follow. Whether it is good practice in every case of fracture of the skull, without some very definite evidence of compression, to be brought to the operating room and operated upon without very definite views as to what has happened in that brain, I am not quite prepared to say; one must hesitate before undertaking such very radical treatment.

Dr. F. R. England: I do not know that I can add anything to what has been said by Dr. Robins and Dr. Springle. In head injuries it is always an important question to decide whether the brain has suffered injury or whether the skull alone has been fractured. The cases referred to by Dr. Robins to illustrate a group of cases where there is no question as to the necessity of operative interference remind me of a case which was only recently admitted to my service in the Western Hospital. A young woman fell down stairs and showed symptoms of head injury. Three days later, when I first saw her, she was unconscious, pulse weak and soft, respiration slow, extremities cold, blood pressure 85, spinal fluid bloody. The whole picture was one of intracranial hæmorrhage where the end was fast approaching. The skull over the temporal region on the left side was opened and two ounces of blood and clots escaped when the dura mater was incised from the middle fossa of the skull. A drainage tube was carried beneath the membranes deep down into the fossa and brought out through the angle of the scalp wound. All the symptoms rapidly improved; she was conscious next day and left the hospital in good condition at the end of three weeks after operation. Dr. Robins remarked that I held that the cases often did best where the injury had been very severe, where the skull had been shattered and driven down upon the brain with laceration of the membranes and even the destruction of the brain tissue. The recoveries in some of these cases is certainly remarkable, and they do not generally suffer from headache, mental feebleness, irritability, or traumatic neurasthenia so frequently seen following head injuries where no operative procedures have been carried out.

Dr. W. E. Archibald: Dr. Robins's paper has been extremely interesting. The question of whether one should operate or not in the presence of a fracture of the skull is in many instances one that taxes more the judgement of the surgeon, one that needs more careful and continuous scientific observation in its decision, than any other. There is, I find, a fairly large number of cases in which operation is obviously necessary; there are a certain number so severe that operation is either out of the question or is undertaken as a last resort and with practically no hope of doing the patient any good; and finally there remains a very large middle class of cases in which judgement as to operation is difficult. I have been tempted frequently to cut the Gordian knot of this difficulty by operating on all cases save the light ones, just as many of us do in the matter of appendicitis; that, however, is not a thoroughly scientific attitude. How are we to determine? It seems to me we have to take a panoramic view of all the symptoms; we must judge, not alone from a lumbar puncture, or alone from the blood pressure, but with these as compared with the work of the respiratory and the cardio-inhibitory centres, and with the depth of unconsciousness, and with the localizing signs which may be found in the examination of the nervous system. We must diagnose the pathological condition present within the skull-cap on the physiological basis. We must not think in terms of the text-book or the catalogue. In the presence of a slow pulse, one below 60, and unconsiousness, we all probably think that operation is strongly indicated; with disturbed rhythm of respiration we think it still more strongly indicated. But there are a great many cases in which blood pressure is not high, not over 150, in which the pulse runs around 70 to 80, the respirations not at all disturbed, but consciousness is more or less lost: are we to operate on those? A great many of these will get well if you leave them alone, but some of them will die unexpectedly. I have come to see that in a certain number of cases you cannot tell by dint of taking the blood pressure, lumbar puncture, or observing the respirations, what they are going to do; and I have come to believe that in such cases the symptoms of compression, that is, high blood pressure and slow pulse, particularly, are masked by the symptoms of concussion, the low blood pressure and more rapid pulse, the result being that a happy medium or, if you will, an unhappy medium, is struck which leads one to a false sense of security. Therefore I am inclined more and more to concur in Dr. Springle's opinion that we should operate more frequently than we have been accustomed to do in the past. I have gone through stages, first, operating too often, second, too infrequently, and I have now come to the third stage where I operate more frequently than I did because many of these cases are apt to die suddenly without giving any sign that the graver condition was present.

Lumbar puncture is not of much value in the mere establishment of the fact that there is blood in the spinal canal; but it is of considerable value in showing how much blood there is. It is true that the more blood there is in the cerebro-spinal fluid the more serious is the condition present. On one occasion I found a lumbar puncture pressure of 1000 m.m. of water in a case of what was nothing more than concussion on the third day of the injury without rise of general blood pressure. This rise indicated an extreme degree of pressure in the cerebro-spinal system; I was able to relieve all his symptoms, particularly violent headache, by lumbar puncture alone. On the other hand you may get a very low lumbar puncture pressure when the brain stem is pushed down in the foramen magnum by serious intracranial compression, so that lumbar puncture by itself is of no great value in prognosis unless there is a large amount of blood in the fluid.

The idea that we can always relieve by decompression dangerous intracranial conditions needs, I think, modification. In a really bad case decompression will not save; in moderate cases it may perhaps save some, but will frequently be unnecessary as regards saving life. As to whether it is better to operate in order to forestall epilepsy, much has yet to be learned. I do not think myself that epilepsy is often staved off by decompression at the time of the accident. The late results of the head wounds in the present war have shown that epilepsy has been surprisingly infrequent. Holmes and Sargent in 1100 cases of gunshot wounds of the cranium, examined six to eighteen months after the injury, found epilepsy and insanity to be remarkable by their absence.

Dr. G. D. Robins: I understand Dr. Archibald to refer to the number of cases that can be saved by operation in fracture of the skull as trifling; that is absolutely against our experience at the Western Hospital. There is no doubt at all in my mind that a large proportion of cases can be saved and have been saved by operation, that were clearly, from the way in which they were going on, certain to die otherwise. The case that Dr. England referred to is a notable illustration of this fact. As to what concussion means that is a disputed point, but I think it might be briefly defined as acute compression of the brain. I would like to refer to a case of fracture of the skull which I saw in the country, as representative not only of perfect recovery where there had been loss of cerebral tissue, but also as illustrating the great resistance to infection that the brain sometimes shows. A child three years of age went out behind a horse in a barn yard and was kicked in the frontal region close to the Rolandic area. I first supposed it was merely a torn scalp, but on examination I found the cerebral tissues freely mixed up with the hair and pieces of bone. The child was given an anæsthetic, the loose brain substance removed, and the brain cleansed as thoroughly as possible with peroxide of hydrogen. It was expected that meningitis would set in and the child die but he got better without an untoward symptom. A star case of Dr. England's at the Western Hospital may be mentioned. We have told of some cases that were very nearly dead and were saved by operation but we have not yet referred to the case that was actually dead (officially), and came to life again. This man was brought in with a depressed fracture of the frontal bone and in very bad condition. At operation the frontal bone was pried up, the hæmorrhage relieved and, contrary to all expectations, he recovered. In the meantime the newspapers had printed a report of the accident saying that the man had died, and subsequently the superintendent of the hospital, when called to the morgue regarding another case, found to his astonishment that an inquest was actually in progress on this man who was neither dead nor likely to die!

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Annual Meeting, 1917, Rimouski.

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Annual meeting, Saskatoon, July, 1917.

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PRESIDENTIAL ADDRESS

THE CANADIAN MEDICAL ASSOCIATION

By A. D. Blackader, M.D.

Montreal

Members of the Canadian Medical Association:

MY first duty on rising to address you this evening is to express my appreciation of the honour always involved in acting as President of this Association. The present time is for all of us one of deep anxiety with a great sense of unrest. The black and angry clouds of war have hung heavily over our country for three years and still show no signs of lightening. Many of our members are overseas striving to mitigate the horrors of this terrible conflict. Not a few have given up their lives in behalf of country, liberty, and our ideals of honour, truth and justice. It is therefore, with much doubt and some trepidation that this meeting has been attempted. Three years ago Dr. McKechnie of Vancouver was chosen as your President-elect, and that western city was selected as our place of meeting. Owing to the disturbed conditions throughout the country produced by the war, and to the fact that so many members of our profession were overseas, the committee deemed it impracticable that year to hold the meeting. The next year saw no improvement, but at the meeting of the Executive Council held last June in Toronto, it was decided that it would be unwise to let another year pass without an annual gathering. Montreal was asked to take charge of it and at a later conference, in the absence of many now overseas who might have held the position more worthily, I was asked to accept office as your President.

Delivered by the President of the Canadian Medical Association at the annual meeting at Montreal, June 14th, 1917.

An active assistance in rendering the meeting a success was promptly promised by all the officers of the Association both here and in Toronto; and to-night I desire to acknowledge how generously such assistance has been given and how greatly the success of our meeting is to be attributed to the loyal efforts of your officers and all the members of our local committees. In their name and on behalf of the profession in this city, I bid you welcome to Montreal.

The year for us is a noteworthy one. Fifty years ago, on the July 1st, 1867, Canada may be said to have reached her majority, and from the position of a group of narrow and comparatively insignificant provinces lying on the banks of a magnificent waterway, she stepped into self-conscious nationhood as a Dominion, embracing a territory which now stretches from the Atlantic to the Pacific, and containing a population which is every day becoming more self-reliant, with citizen soldiers who in this frightful war have already written their names in large letters on the page of history. We do well to meet on this semi-centenary of our nation's birth.

This year is also the semi-centenary of the formation of this Association. In the *Canada Medical Journal* for July, 1867, edited by Dr. George E. Fenwick and Dr. F. Wayland Campbell, the following notice appears announcing its inception: "A movement has been started under the auspices of the Quebec Medical Society, to establish a medical society for the Dominion of Canada. At a recent meeting it was unanimously resolved that the Quebec Medical Society recommends the calling of a convention of medical delegates from all the universities, colleges, medical societies, etc., in the Dominion of Canada, to meet in the City of Quebec on the second Wednesday of October, 1867, for the purpose of adopting some concerted action on the subject of medical legislation, and for the formation of a Canadian Medical Association."

In accordance with this resolution, on October 9th, in the Grand Hall of the University of Laval in Quebec, 148 delegates, from Louisburg in the east to Windsor in the west, gathered together under the chairmanship of Dr. Sewell, then President of the Quebec Medical Association. After some few opening remarks emphasizing the advantages both to the profession and the public to be derived from the formation of such a society, it was moved by Dr. Harding of New Brunswick, seconded by Dr. Marsden of Quebec, and carried unanimously: "That it is expedient for the medical professon of the Dominion of Canada to form a Medical Association to be called 'The Canadian Medical Association'."

Sir Charles, then the Hon. Dr. Tupper, C.B., was elected as president, Dr. Pelletier of Quebec, as vice-president, with Dr. A. G. Belleau as general secretary, and Dr. Hingston, afterwards Sir William Hingston, as local secretary for the Province of Quebec. The annual membership fee was placed at $3, and committees were appointed to frame a constitution for the Association, and also to consider and report on the following measures: the question of preliminary education; the best means to be taken to secure a uniform elevated standard of medical education throughout the Dominion of Canada; the best method of securing a uniform system of granting licenses to practise medicine, surgery, and midwifery in the Dominion of Canada; and, lastly, the best means to secure the establishment of a uniform system throughout the Dominion of Canada for the careful recording of vital statistics in association with a Department of Public Health.

Among those present are the names of all those whom we now revere as the leaders at that time of medical thought in Canada. So far as I have been able to find out, Dr. Montizambert alone of all those who appear on that register of October, 1867, is alive to-day. All the rest have joined the great majority. But in the above resolutions they have left an excellent example for us to follow, and an indication of the character of the work, which we as an association should strive to accomplish.

In selecting, therefore, a suitable subject for some remarks this evening, I decided that as this was the Jubilee year of our foundation, it would be in order briefly to review the advances which have been made along the lines originally laid down by our founders fifty years ago, and then after a discussion of what our aims as a Dominion Association should be, to call attention to the many public problems which call for consideration and action by us at the present.

Referring first to the measures considered at this gathering of the profession in Quebec, the accomplishment of which they considered to be of so much importance, we may state that the amount of preliminary education now demanded of students entering upon the study of medicine throughout the Dominion may be regarded as high and is by many considered to be sufficient. Several universities, however, with the object of fitting their students more perfectly to grapple with the deeply involved problems of disease, propose to add a preliminary collegiate year of scientific training, so that the student may enter upon his purely medical career more thoroughly equipped.

Although complete uniformity of study for the license to practise does not at present exist throughout the several provinces, it may be stated that in all the standard is high and that a certain amount of mutual reciprocity between them exists. Furthermore, it is a matter of very general satisfaction that for the past four years we have had a Dominion Medical Council, and with it the possibility of Dominion registration; a registration which enables its licenciates to practise not only throughout the whole Dominion, but also in any part of the British Empire. The achievement of this great result we owe to our Honorary President, Sir Thomas Roddick, who with indomitable perseverance and not without much personal sacrifice, secured the enactment of what is now termed the "Roddick Bill". Every member of the profession feels grateful to him for this far-reaching and most beneficent enactment, and on behalf of this Association I desire again to tender him an expression of our appreciation of the ability and zeal shown in securing its passage through Parliament, and to say that we regard it as an achievement which only he could have accomplished.

Another important object set before this gathering of fifty years ago was the establishment of a system for the complete record of vital statistics to be associated with a Department of Public Health for the whole Dominion. In this matter we can record little progress; much remains to be accomplished and final victory will require all the influence which this Association collectively and individually can exert. Premiers have promised reforms and Ministers of the Crown on public platforms have made statements, announcing that a department of public hygiene would be established in the near future on a sound and modern footing. Nevertheless, up to the present time there are no indications that steps have been taken towards a realization of these promises. We are told that there are "difficulties". In honour to the original members of this society who first applied for the measure, we of the present generation should not allow the matter to drop, but year by year should place on record an affirmation of its importance not only to our profession, but also to the general public.

An association such as ours may be considered as existing for three purposes. The first, and certainly a most important purpose, is the advancement in knowledge of the individual members by discussions on topics of medical importance, led by those who have had special study, or who have had special experience in what may be termed the "front line trenches" of medical thought. In this matter our Association has every reason to feel that it has in the past done its duty, has accomplished much good, and deserves well of its members. Whether the meetings have taken place in the East or in the West, the Association has always presented to its attending members programmes of work which should have repaid every one for the trouble and expense involved in the act of attendance. Doubtless in the future we shall be able to offer still more interesting and extensive programmes than we have done in the past, and in this way increase our usefulness.

A second object to be attained in a society like ours is the binding together of its members by means of social intercourse, thereby ensuring a better knowledge of one another. This is of special importance in our country where long distances separate the members and clashing provincial interests may interfere with good feeling, and may even threaten the life of the Association. For this reason the entertainment side of our meetings must not be overlooked.

Members come from long distances and they should receive always a warm welcome. Every member should take pleasure in meeting old friends, especially old college chums, and in renewing acquaintance with men who in distant cities are working on allied problems. It is also not to be forgotten, that there is a very positive mental stimulus to be derived from this social contact with one another, the passing of opinions to and fro, and the quiet discussion of knotty problems. The wise man tells us that as "iron sharpeneth iron, so a man sharpeneth the countenance of his friend"; and also, "as in water face answereth to face, so the heart of man to man." I am sure that every member who has attended our meetings in the past has returned home feeling that not only has he added to his professional knowledge, but that he has also been cheered and stimulated by contact with workers in similar fields of thought.

Again, the great necessity for the profession in Canada to meet once a year and discuss the many social and economic problems which are developing rapidly and threaten to affect seriously the standing of our profession and modify its activities, is a third and very important *raison d'etre* for this Association, which should not be overlooked. This Association should be a sort of clearing-house for the exchange of opinions, and for the full discussion of all matters pertaining to the health and sanitary well-being of the community, and of the relations between the public and the profession. As individuals, physicians have always taken great interest in the improvement of social conditions, and in the furtherance of the public weal; but collectively, our profession is inclined to be silent. Its tendency has always been to develop an attitude of cloistered retirement from public affairs, due in part to the urgent character of the work of its members, and to the incessant demands upon their time and sympathies; and, perhaps, in part also to defective training, and to the feeling prevalent in our midst of "letting the other man do the talking".

But the times are changing and our profession must wake up to the fact that powerful influences are being exerted upon it from many quarters, and if it is to have the weight and influence in the public councils that it undoubtedly ought to have, it must speak early and clearly, and give its reasons and not delay until public opinion has crystallized into legal enactments. No other society or association of physicians in our Dominion can speak so authoritatively, or so effectively as can this Association. In my opinion it is a duty which should not be shirked. But before we speak, conditions must be carefully considered. Vice-Chancellor Wesbrook, in an address delivered before the Pacific Division of the American Association for the Advancement of Science, said: "Medicine has been born, or at least reborn, in the last quarter of a century and the new science has not yet become orientated to those other forces in human environment and relationship which activate social and economic developments," and adds, "It is impossible to foretell with certainty the place of medicine to-morrow." There is much truth in these statements.

Many of the influences contributing to this changed outlook in the profession have risen within the profession itself. The great advances which have been made in our knowledge of the chief factors in the production of disease, and of the methods in which they may be combated, together with the complex problems involved in our attempts to penetrate the mysteries of infection, immunity, and anaphylaxis, are putting a new strain on the student and on the practitioner. Both the study and practice of medicine are becoming more complicated. We are raising our matriculation standards, we have lengthened the years for study. Even after graduation no single individual can keep abreast of the rapid increase of knowledge in every department, or master the technical skill demanded in each. The day of the general practitioner and of the family physician appears to be passing, and numerous specialists begin to take their place. With specialization comes the unavoidable demand for coöperation between the specialists. How this will eventually develop cannot to-day be clearly foreseen. The necessity for team-work is now manifested in all our large hospitals. Outside of our hospitals proper, the phenomenal success which has attended the group system, as evolved by the Mayo Brothers must, we think, lead to the system being introduced in various districts and in many countries, either on the business basis of coöperation, or on what is much to be preferred, a public service basis, under the control of the various local governments. Already throughout the States, large corporations of every character, banks, railways, manufacturers, and even departmental houses, demand this group or team system in their medical service, and the general practitioner suffers. These conditions are tending to make the practice of our profession in some public appointment, with only limited activities, but with a fairly lucrative income, more attractive to our graduates than private practice, in which although the physician is nominally his own master, he has less spare time, and finds his income materially affected by the specialist on the one hand, and by the public institutional treatment of an increasing number of infectious diseases on the other. As the result of these influences on the profession, the kindly, self-sacrificing type of family physician will, I fear, gradually disappear, and with him will pass the qualities which enshrine such a man in the hearts of his patients, the keen sympathy and intimate personal knowledge; and with the disappearance of these, there may develop in the profession a tendency to descend from its high ideals and to degenerate into a mere business or trade in which mercenary gain is the chief end. Against the appearance of such a tendency let us all cry, *absit omen.*

Another important evolution contributing indirectly to change in our outlook, but acting from without the profession, is the rapidly increasing appreciation by the general public, and by the employers of labour, of the great economic value of health and of the economic loss brought about by the neglect of proper hygiene, and by the lack of fresh air and sunshine in factories and dwelling-houses.

The heads of government also are recognizing that not only is the well-being of many millions of workers involved, but also that industrial success and the development of the country are checked if due attention is not given to the many problems associated with the maintenance of health.

Provincial and municipal authorities under the flagellations of experience and science, are waking up to the necessity of securing every possible improvement in the sanitary conditions surrounding all classes of workers, both in the workshop and in the home, and in all such health-giving improvements members of our profession should be the leaders.

Important, however, as is the securing of proper sanitation for the wage-earner, there are other problems which have to be faced, and one to which much attention has recently been given is the financial distress produced in families with small incomes by the effort to meet the strain induced by accident and sickness. It is found that in a large proportion of the families of the working-class, disease leads to distress, and distress to disease, and in this vicious circle of circumstances charity in some form has been obliged to come in and bring assistance. In the past, numerous hospitals and dispensaries have been organized throughout the country in the hope of taking off a great portion of this strain, and quite recently Dr. Cabot, of Boston, introduced a department of social service into the work of the Massachusetts General Hospital to meet the conditions which it was felt had not yet been relieved. There are many objections, however, to this mode of charity, and perhaps the most important is that it places all its beneficiaries in the position of paupers, in that all are the recipients of charity from the governors of the hospital, a charitable public, and the attending staff who give their valuable services for nothing. This cannot be regarded as an ideal condition. With our present arrangements a self-respecting man, on a small income, has either to accept this charity, or to pay high fees for special work. If he attempts the latter he at once finds himself pecuniarily straitened by hospital charges, surgeons' fees, and anæsthetists' fees, not to speak of his own physicians fees, while, in many instances, his troubles are aggravated by his temporary loss of income.

In an address recently delivered in Baltimore, Dr. J. Whitridge Williams speaking on this question said: "Ask any employee who has a family and a bare income of $2,000 a year what it cost him to have his appendix removed, or to have his wife treated for a nervous break-down, and you will have the problem clearly before you." Efforts, I know, are made in many hospitals by means of semi-private beds and coöperative clinics, to permit some modification of these expenses; nevertheless, difficulties and irregularities have appeared in almost every scheme. A more ideal plan appears to be that of an insurance under which all wage-earners on small salaries are compelled to accumulate a reserve during their period of productive activity which will at least in part defray expenses during periods of disability. Experience indicates that such insurance can be best carried out under governmental control, and with some governmental assistance, on what many might regard as a more or less socialistic basis.

As the result of an increasing appreciation of these facts, many countries have adopted such a scheme. Insurance of this character was first introduced into Germany by Bismarck and William I. as a means of relieving and forestalling distress. Its operation proved so successful that other states copied it, and before the war began it existed as law in many European states, and very recently with modifications was pressed upon the English profession by Lloyd George. Though it was loudly condemned at the time by many physicians as robbery, Dr. Whitridge Williams considers it a model scheme to promote the health of the community, as well as to provide in case of sickness adequate care and medical attendance for all persons in receipt of a yearly income in England of less than $800. Under its provisions, from every insured person weekly payments of 9d. are demanded, of which the State contributes 2d. while the remaining 7d. are paid by the workman and his employer in proportion varying according to the amount of wages. When these are very small the employer pays almost the entire amount, but when the wage is large, the workman pays the greater share. The insured are guaranteed medical treatment at the physician's office, in their own homes, in hospitals, or in sanatoriums, according to the necessity of the case, together with such nursing as may be essential, and all necessary medical and surgical supplies. In each community all reputable physicians are entitled to go into the scheme, and such as agree to do so, are placed on a panel, and are paid according to a fixed schedule for such services as they render. The insured may select any physician on the local panel, but must retain him for a specified time, except for good and sufficient reasons. On the other hand, the physician may refuse to accept any patient he pleases, but once having accepted him must respond to his calls until the time agreed upon has expired.

This system has been in operation too short a time to speak definitely on the merits of its details, but Dr. Williams states that so far as he has been able to ascertain, it has proved acceptable in its working to the majority of physicians, as statistics show that over nine-tenths of the general practitioners in England are enrolled on the panels, and that as a result of doing away with gratuitous services, their average professional income has shown a considerable increase. More than this, I am unable to say. I had hoped to have had some definite statistics to present at this meeting, which would have enabled you to appreciate in greater detail the results of the measure. This I will try to do at a future opportunity. In the meantime, I take the following statements of some results obtained in Germany, from a paper read before the Massachusetts Medical Society by Dr. Edsall of Harvard. He says: "In Germany previous to 1911, although compulsory insurance had been only a few years in existence, over one hundred million of people had received benefits from it; in 1910, even before an additional income was provided by a new law, $500,000 a day was spent not only in benefits to the injured and ailing, but in constructing and maintaining hospitals and institutions for the sick and invalided, and in a variety of other ways which would tend to the improvement of public health, including even the construction of public baths, and the lending of money at a low rate of interest for the building of sanitary houses for the working classes." In Canada, thus far, very little attention has been given to a measure of this character, although, as Edsall goes on to say: "This is the most important question of legislation bearing upon medical men, that has ever come up, not only in reference to their incomes and their freedom of action, but also to the good they may do in their work, and demands their careful study, for it seems highly probable that whatever medical men may or may not wish, it will soon become an enactment in this country."

Already throughout the United States, numerous committees have been appointed by societies of all kinds to study and report on the desirability and feasibility of such compulsory state insurance. In a recent article in the *Journal of the American Medical Association,* Dr. Lambert writes: "To obtain more effective measures of caring for the sick poor and for those of small means in a community, has been the aim of the framers of the Health Insurance Bill of the American Association for Labour Legislation. Whenever compulsory insurance has gone into operation, an amount of real sickness has been disclosed that has surprised even those physicians who work among the poor. It appears that only about 50 per cent. of the total number of the sick outside of institutions are found to be under the care of physicians, and a still larger number do not receive adequate nursing care." Further on he says that "to obtain the best economic human value from employees, or to give the best economic value to employers, there must be a change in the methods by which medical service can be obtained, and a broadening of the opportunities for adequate nursing service. In any health insurance scheme intricate machinery is necessary and physicians are an essential part of this machinery. The service rendered by the medical profession must be on a business and not on a charitable basis. Because charitable service has been rendered to the poor without reward in the past, is no justification for asking that physicians under a health insurance law should not be justly and adequately remunerated for efficient service."

In England the physicians paid little attention to the measure, until prospective, or in some cases actual financial pressure led them to act, and then the opposition which they raised to many of its provisions led to a widespread impression that mercenary reasons and not a just appreciation of the beneficent workings of the bill influenced their action.

Let us avoid such a possibility in Canada, and be prepared to consider the measure from every point of view, and perhaps even to further its advancement by our own action, for I feel assured that with broad and friendly consideration from the profession, the details of an insurance scheme can be arranged so as to secure entirely dignified terms for our members, and to accomplish mutual benefit for all parties. I would, therefore, urge this Association to appoint a strong committee which should include representatives from every province to give the matter their careful consideration, and to present a report upon all the important points to be considered in such a Bill, and upon the means to be taken to safeguard the true interests of our own profession. There are many other matters of public interest which demand from our Association thought and an expression of our opinion as to the best course to be taken in regard to them. To mention only a few: the compulsory notification and treatment of venereal disease; the prevention of occupational disease; the control of indecent and misleading advertisements of quack medicines, and of proprietary and patent medicines as a class. All of these demand from this Association careful discussion and definite action. It is only through free discussion in an association such as ours, that the profession in Canada can gain a proper perspective on important public problems, and develop a fair judgement on the many social evolutions to which they will undoubtedly be required to adapt their life work. There is great need in Canada for the development within our profession of leaders who, actuated only by disinterested and patriotic motives, will undertake to study the numerous social and economic questions which are certain to arise and to direct our counsels with clear judgement. We cannot solve present problems in terms of the medicine of the past, but must strive to adapt both our theory and practice to the ever-increasing needs of humanity. We dare not stand still or stand aloof.

In conclusion, let me suggest to the Association the desirability, following the example given us at the first meeting of our Society in Quebec, of appointing committees to study and report annually on some of these important problems which face our profession, and to devote at least one whole session at every annual meeting to their discussion. Let our Association at once take its position as a society in which every member is imbued with a strong Canadian patriotism, and in which all deliberate in a broad impartial spirit over all problems whether affecting East or West, in complete coördination with our several provincial associations, and with all our country and city societies. In this way only is it possible for us to accomplish the work that lies before our profession throughout the Dominion; each province, each city, and each member developing the best that is in them for the advantage of all. The terrible strain and agony we are all now passing through will be endured in vain if each one of us does not learn the happiness, the value, and the honour involved in the act of serving one another.

MEMBERS of the Canadian Expeditionary Force to the number of 605 are at present undergoing treatment for tuberculosis. In 322 of the cases the disease developed during the period of training preparatory to going overseas.

DR. J. W. S. MCCULLOUGH of the Provincial Board of Health, Ontario, announces that on and after June 20th, 1917, facilities will be provided in the laboratories of the Provincial Board of Health at Toronto, Kingston and London for the free diagnosis of venereal diseases. Outfits for taking specimens will be supplied to all physicians for this purpose. These outfits may be procured from the laboratory of the Board, 5 Queen's Park, or from the Board's branch laboratory, Queen's University, Kingston, or the Board's branch laboratory, Ottaway Avenue and Waterloo Street, London, Ontario.

On and after this date outfits may be procured from the same laboratories for the purpose of taking specimens for the diagnosis of typhoid, diphtheria and tuberculosis. Sterilized bottles for sending water samples may also be procured from any of these laboratories.

SLIGHT VARIATIONS FROM NORMAL STRUCTURE AND FUNCTION, AND THEIR CLINICAL SIGNIFICANCE

By Theodore C. Janeway

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IN a very suggestive lecture before the Harvey Society last autumn,* Professor Haldane called attention to a point of view which he believes is creating a new physiology. Looked at from this standpoint the living animal organism is more than the sum of all its parts and is, rather, a whole which determines its parts. To quote more exactly, he said: "Physiological study, and biological study generally, seems to me to make it clear that throughout all the detail of physiological 'reaction' and anatomical 'structure' we can discern the maintenance of an articulated or organized normal." He further ventures the hope that such a new physiology may teach medicine what health really means as "the condition in which the organism is maintaining in integrity all the interconnected normals which . . . manifest themselves in both bodily structure and bodily activity". He trusts that physiology will teach how health is maintained under the ordinarily varying conditions of environment, and pathology how health tends to reassert itself under totally abnormal conditions, while pharmacology may discover how drugs can be used rationally to aid the body in the maintenance and reëstablishment of health.

This programme makes a strong appeal to me as a physician. To assist our patients in keeping well we devote a far larger portion of our time than did our fathers, and the care of the well and the cure of the sick sum up the duties of the practitioner in his private and personal relation to his patient. However, the medical man serves in many capacities beyond his fundamental and traditional relation to his patient. The maintenance of health has become a highly specialized activity of the social organization, and the discovery of the cause of disease and of methods for their prevention are of paramount importance. In the conduct of the great enterprise of life insurance, in the selection of the fit for the service of the state in war or in such posts as require the highest physical efficiency during peace, physicians exercise a necessary function. They must pronounce judgement as to the existence of a state of health, and must protect primarily the interest of the state or the corporation, not of the individual.

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* *Science*, 1916, xliv, 619.

Furthermore, knowledge of disease has in our day been so popularized that large sections of man, and still more of womankind, seek our advice on the least suggestion of anything wrong with their physical or mental machinery, and demand of us that we shall make the most exhaustive examinations to reassure them that each and all of their organs and functions are absolutely normal. Periodical medical examination of the apparently healthy is being enthusiastically proclaimed by sections of the medical profession as the great means for preventing chronic disease and assuring an unheard-of longevity for the whole human race. It is not my purpose here to discuss the value of such examinations nor to call attention to the lamentable disproportion between our skill in detecting chronic disease and our ability to control it. Examinations of the supposedly healthy we must each one of us make, and they will constitute, in all probability, an increasing fraction of our daily work. They demand of the physician a different attitude from that which determines his actions in the care of the sick. He must look at his patient from a new point of view. The fundamental question he must answer is not, "What is the matter with this man?" but, "Can I pronounce this man structurally and functionally normal?" If not, the second question must be put at once, "What is the clincial significance of the deviation from normal, either in structure or function, which I have detected?" The problem is therefore primarily one of prognosis, not of therapeutics, and development of prognosis as a science has lagged far behind that of diagnosis, and even behind our still halting treatment. It has been slurred over in our text-books, and very rarely given any important place in the instruction of medical students. The development of the vast armies that are to-day defending our common heritage of political ideals and institutions has made this kind of prognosis a concern of the most pressing practical importance to the medical profession and to the world. I have therefore felt that the opportunity to address you to-day, with which you have honoured me, might best be used in the very practical consideration of certain of these problems from my personal experience with them.

The vast extension of knowledge of the normal organism during recent years, while of the utmost value to the clinician, has greatly complicated his problem. Each new norm determined in the laboratory means a new possibility for variation from the normal in the patient. This has resulted in a tremendous increase in the number of recognizable disorders of function concerning the importance of which in man the physician must form a judgement. Clinical observation by the same exact methods with which the physiologist made the original discovery must then determine the limits within which variations in function are insignificant, or passing which they become dangerous, in addition to studying their causes and their remedies. Clinical medicine, therefore, takes up the task where physiology leaves it, at the frontiers of the abnormal and the solution of these problems may require years. Most of you remember clearly how the introduction of clinical methods for the measurement of the blood pressure led at first to very erroneous views of the dangers of high arterial pressure, which were only modified after patients had been observed to live with marked hypertension for ten years or more. The study of the blood pressure of the normal animal could give no clue whatever to the prognostic significance of abnormal blood pressure in man.

From still another enrichment of medical science has the work of the practitioner grown in complexity. The great refinement of diagnostic methods now makes it possible to detect the slightest deviation from the normal in many structures and functions. With the rœntgen ray and with high-powered microscopes we recognize anatomical lesions whose existence a short time ago would have remained hidden until they reached a much more advanced stage. By instrumental and chemical and serological methods, and by many specially devised exact experimental tests of function, we acquire a surprising degree of insight into, and measurement of, the slightest variations from the normal. The more elaborate the investigation, the more frequently will some abnormality be found. This is not an unmixed good. Its value depends on the correctness of the judgement formed from all the facts, and of the action based on that judgement. When Richard Bright recorded the cases which linked his name forever with chronic disease of the kidney, he did not use the refined diagnostic methods of to-day. The modern physician who tells a patient he has Bright's disease as soon as he has discovered a trace of albumin and a few hyalin casts in the urine, or a blood pressure a little above the normal, would do less harm if he had only the methods of Bright's day at his command. I was about to say that he would be a better physician, but such a man can scarcely be a good physician, let alone a better one. The larger the number of data with which the physician must reckon, the more of experience and of common sense must he possess, if he is to form wise opinions. We can all of us, I think, recall occasions in our earlier years when some older practitioner, ignorant of the latest laboratory methods, was able from his experience to predict the favourable outcome of a case which our methods, but inexperience, led us to consider hopeless. Nevertheless, methods may and must be taught, and the progress of medicine goes hand in hand with their refinement. Experience, on the other hand, is an intimate and personal possession; only a little of it can be handed on from man to man or from generation to generation. For the most part each must acquire it laboriously for himself and largely through reflection on his mistakes. The young graduate, well trained in observation, will surely grow older and wiser if he but have opportunity.

While "knowlege comes, but wisdom lingers", we may also confidently assert with Tennyson that "the thoughts of men are widened with the process of the suns". Experience itself may not be given or bequeathed, but the results of experience may be classified and set forth and lead to the formulation of criteria for judgement and rules for practical action. This attempt, in a limited field, I shall essay to-day.

The first result of my experience which I would lay before you as an aid to wise judgement concerns the attitude of the physician toward the problem before him. To give a medical opinion is not an academic exercise. Its standards are not the standards of abstract truth, but of fidelity to fact combined with loyalty to the best interests of the patient or of the organization for which the examination is made. Utility is implicit in it. Examinations which go beyond the possibilities of useful application of the findings obtained are research, and must be conducted consciously as such, though the opportunities offered to conduct such incidental research should be embraced where possible. Apart from such research no method is so simple as to be worth employing if it can yield no valuable result for the patient, and none is too elaborate if it can save life or in the slightest degree shorten illness or point the way toward health. It is not scientific to employ every possible method of investigation in the examination of every patient, but is meddlesome, is usually dishonest in the unnecessary expense for the patient which it entails, and where thus employed, clouds, not clarifies, the judgement. In spite of the fact that, in difficult cases, it may be necessary to have examinations by a number of specialists before determining the diagnosis and the consequent prognosis and treatment, in the end the opinion must be one opinion, given by one physician about the one patient considered as a whole, not as a catalogue of separate diseases. Department-store medicine, with all its popularity at the present day and its seeming extreme thoroughness, is not wise medicine unless it be directed by a master-mind capable of passing judgement on every one of the facts assembled, and himself capable of applying the more important of the methods of investigation employed. It can no more be successful medicine, judged by the true standards of success, which in medicine are never commercial standards, than can a department store without a guiding and organizing mind directing its policy, and familiar with the bulk of its methods, be a business success. Whether he be obscure country practitioner or renowned city consultant, no man can be a good physician who does not form his final judgement of a case with the whole human problem before him as though he himself were in the patient's place. I know of no better safeguard against inconsidered opinion, and no sounder rule by which to solve that most knotty medical problem of what constitutes telling the truth to a patient.

A second result of my experience is that the concept normal as applied in the everyday work of the physician has a high degree of relativity. Here again it is a case of whole views against partial views. This the new physiology recognizes clearly. There is no such thing as a normal composition of the urine, for the kidney is striving constantly to maintain by its secretion a normal composition of the blood which remains in the body, not of the urine which is separated from it. The older ideas of a normal urine represented merely an average composition of this secretion under reasonably constant conditions. Certain of the body's norms, such as the hydrogen-ion concentration of the blood, and its sodium chloride content, are maintained with great constancy by regulating mechanisms, and even slight variation from them entails serious disturbance. Others, like the rate of the pulse and of the respiration, have a wide variation to adapt the circulation and the excretion of carbon dioxide, to meet the widest range of functional activities. The clinician must take into account not only the facts that he observes, but the conditions under which he observes them, and, before pronouncing judgement, must frequently perform the subjective act of comparison and interpretation. Not only do functions vary in activity or repose, but individuals differ from one another. There are variations as a part of the normal life-history from infancy to old age which affect structure as well. Wide differences exist between the sexes and between the different races of mankind. Every one of these factors must be weighed by the physician before he pronounces a certain finding abnormal, and again before he determines its significance in that particular patient. Examples of them I shall present shortly.

A frequent mistake with patients, and an occasional one with physicians, is the substitution of an ideal of physical perfection for the normal standard of a human being subject to the changes and chances of this mortal life. I have convinced myself at times that certain neurasthenic patients who consulted me were suffering from a consciousness of their physical inferiority, not to an ordinarily healthy person, but to this ideally perfect creature of their imagination, and that simple sensations of fatigue or discomfort which the use of the body entails on every one of us, gave rise in them to the lively apprehension of disease. I have occasionally persuaded such patients to reduce their standards of health to the practically attainable, with very beneficial results. The aspiration in Tennyson's "Two Voices",

> " That type of Perfect in his mind
> In Nature can he nowhere find,
> He sows himself on every wind"

is not a guide to the attainment of bodily health. Neither patient nor physician has a right to set up for the human body any type of perfect which can not be bound in nature. Metchnikoff has very wisely called attention to the useless and vestigeal structures and the many types of imperfection which are a part of normal man as we know him.

In the third place, the purpose for which the examination is undertaken must influence greatly the decision as to the significance of the findings. In the examination of candidates for commissions in the Army, far more rigorous tests of the functional integrity and range of adaptability of the central nervous system and of the circulation are required for the Aviation Corps than for the line, while, for the Quartermaster's Corps, a still less severe examination may suffice. Similar distinctions ought to be made among our civil patients. Health and muscular development for the mother of a large family must be gauged by different standards of normal than for a college football player. Examinations for life insurance must reckon with the possible attempt of the candidate to deceive the examiner, and great stress be laid upon the objective evidence of disease. The existence of a heart murmur, for instance, is usually made the basis for rejection, yet, from the standpoint of the patient, many a systolic murmur is of no significance whatever, and the heart with one may be a far sounder heart than another whose disease is revealed only by subjective sensations. In dealing with apprehensive individuals, on the other hand, who need, of all things, the assurance that health is not permanently impossible for them, only the most positive evidence of important lesions or symptoms should convince one of the existence of organic disease. In the case of suspected, but unproved, tuberculosis, the social and economic status of the patient may also legitimately influence one's decision as to the significance of slight abnormalities as a guide to action. For the well-to-do, economic sacrifice based on a false alarm may often be preferable to running any chance of serious disease. With our dispensary patients, however, the opposite is more often the case; their choice would be to run great risks rather than sacrifice the means of livelihood for themselves or their families. The choice is one they have, within certain limits, the right to make. Those limits are that they make them with a sufficient knowledge of the facts reasonably to appraise the risk. Now I hold that, if the abnormalities which the physician detects on his examination are such as to raise only a suspicion of the existence of clinical tuberculosis, it is not his duty to acquaint the patient with those suspicions and give him the mental anguish which the diagnosis entails, when he knows in advance that the patient cannot afford to act upon anything but a certain diagnosis and the most urgent advice. It is his duty to follow the subsequent course of the patient and be prepared to give an unequivocal opinion and insist on action when the findings become of undoubted significance.

With these general considerations in mind, let us now turn to some of the special problems of interpretation which have arisen sufficiently often in my examination of patients to impress me with their practical importance. I shall discuss them in the order usually followed in a systematic medical examination, but I must disclaim in advance any suggestion that such an order of presentation connotes completeness of consideration. At the best, I can hope merely to touch the high lights; and, as in any such review of personal experience, the presentation will necessarily be one-sided.

First let us consider the facts which may be revealed by the general examination of the patient. The older medicine made much of this because of its relative poverty in methods for detecting lesions of the internal organs. Constitution, habitus, diathesis, temperament, these were all-important diagnostic categories. So much that was fanciful mixed with the real differences of bodily type that the development of percussion and auscultation, and of diagnosis based on the solid facts of pathological anatomy, threw these vaguer appearances into disrepute, as it did the minute scrutiny of the tongue or observation of the pulse. Now we again appreciate that no variations from the usual external form of the body and of the proportions of its parts, in fact no recognizable objective changes of any nature, are without some significance. Since the discovery of the relation to growth and nutrition of certain of the ductless glands, especially the thyroid, the hypophysis, and the sex-glands, the study of bodily type and of physiognomy has acquired great practical interest. Every physician should familiarize himself with those external appearances which unerringly point to the existence of myxœdema or exophthalmic goitre, of acromegaly and other disturbances of the pituitary. This can only be done by acquiring visual memories of these abnormal types. This method of medical education is often neglected in our zeal for the fine analytic methods of the laboratory, but it should be fundamental in the training of every clinician. Lacking a large clinical material for the illustration of the rarer types of physiognomy, much can be learned from books. Such pictures as those in Byrom Bramwell's *Clinical Atlas*, once seen, can never be forgotten. The determination of the significance of slight variation from the normal form and facial expression may be a very difficult matter. It is first necessary to recognize the existence of features suggesting disturbance of one or the other of the ductless glands, and then to investigate the patient's family, his past and his present. There are families in which the women, as they grow older, tend toward obesity and a suggestively myxœdematous facies. Perhaps they have constitutionally less active thyroids, but for practical purposes they are not suffering from myxœdema. The story of the development, particularly in women about the time of the menopause, of a distinct change in appearance and disposition, of sensitiveness to cold, of slight mental dullness or lack of their former alertness, of unusual fatigue, taken in connexion with a suggestive facial expression, some fullness of the upper lids, a persistent wrinkling of the forehead, and unusual loss of the hair, and particularly the eyebrows, in short the finding of a number of minor symptoms and signs all explicable on the basis of a hypothyroidism, with the exclusion of any other cause for these findings, will often lead to a brilliant diagnosis. Such cases should invariably be put to the therapeutic test. The mild myxœdema of elderly women is one of the best examples of the great value of observing very slight deviations from normal structure and function, provided the physician has visual memories with which he makes a prompt mental association.

The same holds for the recognition of many cases of hyperthyroidism, though here, more often, single symptoms point the way, either an unexplained loss of flesh or a slight tachycardia or tremor. An unusual precipitateness in such simple acts as rising or lying down in the course of examination, with an abnormally bright-eyed, staring expression, may suggest to the experienced the existence of this disease before he has asked the patient a question.

Certain other types are not so clear-cut in their significance as the two examples I have taken. It would be impossible to review them all. Some are now in process of study; others remain rather in the nebulous realm of speculation. These latter the hard-headed practitioner without special facilities for investigation had best leave alone, but the well-described abnormal types he must be familiar with and must attempt the diagnosis of in their partial forms.

The relation of certain anthropological skeletal types to resistance against disease is again being investigated. The old habitus phthisicus is one of the best known examples. This may all prove of great theoretical interest, but for the present the practitioner will base his diagnosis of the existence of pulmonary tuberculosis on the signs or symptoms of the infection itself, not on any hypothetical predisposing factor such as a long, flat chest with winged scapulæ. On the other hand, in dealing with children exhibiting any of these skeletal abnormalities which may be linked with low resistance to infection, he should do everything possible, by hygienic and corrective measures, to promote a more normal development of the bodily frame and to secure the largest possible resistance to disease. The same holds good for the slighter abnormalities of posture in children, insignificant in themselves at the time, but capable, unless corrected, of greatly reducing the mechanical efficiency of the body.

We will now pass to the examination of the cardiovascular system, the portion of the subject with which I am perhaps most familiar, and which presents numerous questions of interpretation. Our standards of what constitutes a normal heart have become very precise in the hundred years since Laennec first created the science of physical diagnosis. I believe there is a tendency in many minds to consider these standards far more absolute than they really are. It is clear that the first requisite for pronouncing a heart normal should be the demonstration that it is of normal size. This, however, is not so simple a matter. The size of the heart cannot be mathematically fixed for all individuals, but bears a definite proportion to the size of the individual and to his degree of muscular development. In the second place, unless we use the *x*-rays to determine its size, what we actually demonstrate by our ordinary methods of examination are the position of the borders of cardiac dullness and the location of the impulse. Now the position of the heart varies strikingly. In children it is much more transverse than in adults, and the impulse lies further to the left, often beyond the nipple-line. Some persons have an almost mesially placed vertical heart; others a quite transverse one. The former is common in thin, narrow chested people; the latter in the stout, particularly those with a large corporation. All these factors must be taken into account before pronouncing a heart enlarged. Furthermore, the heart is more transverse in the recumbent than in the erect posture, and each physician should adopt one or the other as his routine in percussing the cardiac outlines. I believe it unwise to consider any heart definitely enlarged the left border of which is not beyond the nipple-line, and the right border more than 3·5 centimetres to the right of the mid-sternal line in the erect posture, 4 centimetres in the recumbent. These are outside figures for large individuals, and should be perhaps a centimetre less in small ones. In questionable cases the decision whether the size is normal or not must rest upon associated findings and always involve a subjective judgement, in addition to allowance for the errors inherent in our clinical observation.

One helpful and simple means for detecting hypertrophy of either ventricle is commonly neglected. The palpation of the apex region for the left ventricle, or of the lower sternum for the right ventricle, using the palm of the hand and applying firm pressure through the extended arm, will often reveal a definite heaving impulse, when the ordinary light palpation has given no suggestion of it. Even in the absence of cardiac enlargement a forcible, lifting impulse is definite evidence of hypertrophy of the corresponding side of the heart. The finding either of hypertrophy or of enlargement always signifies the existence of real lesions; whether these are primary and permanent lesions of the heart-valves or the heart-wall, or are the result of high blood pressure, or of emphysema or other cause acting upon the right heart, or are temporary and curable, as in the case of the dilatation associated with marked anæmia, these points are for the rest of the examination to determine. This much may be stated definitely, that an enlarged heart is never a normal heart.

In many minds cardiac murmurs are considered the ineluctable evidence of cardiac disease. Nothing could be further from the truth, and it is of the utmost importance that the medical profession should be familiar with the frequent occurrence of certain murmurs in the absence of cardiac disease. Diastolic murmurs, whether they be aortic or mitral, may be considered as nearly certain evidence of an organic valvular lesion; diastolic murmurs at the pulmonic orifice, as pointed out by Graham Steell, are commonly due to a relative insufficiency, but, since this occurs as a sequel of advanced mitral disease, we do not reckon with it as a source of confusion. Systolic murmurs, on the other hand, belong in an absolutely different category. The recent studies of Thomas Lewis* in the Hampstead Military Hospital have made this clearer than ever. Systolic murmurs at the apex frequently develop as a result of the excitement of an examination in perfectly normal hearts, and most commonly in the young and athletic. With a few minutes of rest, and return of the heart rate to normal, such murmurs commonly disappear, and, in the absence of enlargement, are of no significance whatever. A very common accidental murmur which, in my experience, has led to a number of serious mistakes in interpretation is the systolic murmur heard in the second and third left interspaces, very loudly on forced expiration, but disappearing completely with forced inspiration. In expiration it may even be accompanied by a thrill. This murmur was always thought by my father to originate in the root of the pulmonary artery, where it lies between the aorta and the chest wall, from a slight degree of flattening during expiration. Anyone who has listened over the pulmonary artery or conus of the right ventricle of the exposed heart of the dog knows how even the slightest pressure produces a loud systolic murmur. I remember a number of instances in which this murmur was considered cause for rejection of powerful football players at the West Point Military Academy. It occurs chiefly in the young, is more easily produced in thin or flat-chested individuals, or in those with a very large difference between the inspiratory and expiratory circumference of the chest. It may be recognized by its disappearance at the end of full inspiration, by the absence of enlargement of the right heart and of cardiac symptoms, and when recognized may be dismissed. Systolic accentuation of the respiratory murmur in the vicinity of the apex may be mistaken for a heart murmur. A little care will distinguish them. Over the left back a similar marked accentuation of the respiratory murmur synchronous with the heart-beat may occur, and be wrongly considered a transmitted mitral murmur. Systolic murmurs in the first and second right interspaces cannot so easily be dismissed from consideration. While they rarely signify aortic valve disease unless accompanied by a diastolic murmur, a thrill, or marked enfeeblement of the aortic second sound, yet they usually indicate some change in the aorta. They are common over a dilated aorta, whether from syphilis of the aorta or arteriosclerosis. They are significant only as calling attention to the need for painstaking exploration for other evidences of disease of the aortic wall. The loud systolic murmurs heard at all the orifices of the heart in severe anæmia are, I believe, usually associated with some degree of dilatation. They are the most familiar of the functional heart murmurs and the least likely to cause confusion. It should be remembered, however, that they indicate a temporary weakening of the heart-muscle and call for safeguarding treatment until blood and heart-muscle have returned to normal.

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* Report upon Soldiers returned as Cases of "Disordered Action of the Heart" (D. A. H.) or "Valvular Disease of the Heart" (V. D. H.). British Medical Research Committee, Special Report Series, No. 8, 1917.

While even slight heart murmurs are usually detected, and even magnified, the important changes in the character of the first and the second sounds are apt to be overlooked. It cannot be too much emphasized that definite accentuation of the pulmonic second sound is more important evidence of serious mitral disease than is a murmur. An accentuated sound is not merely a louder sound; it is a sound of higher pitch and more ringing character. An accentuated sound may be recognized even if it be faint and distant from much overlying fat or emphysematous lung. Accentuation of the aortic second sound indicates either high blood pressure or, if this be eliminated, dilatation of the aorta. Under these circumstances it becomes an important accessory sign of syphilis of the aorta. Changes in the first sound at the apex are much more difficult of interpretation. To know the range of normal variation of the first sound in persons of different ages and different types of thorax requires long experience. In young, thin-chested lads with overacting hearts the first sound often acquires a vibratory quality, the so-called tinnitus; this is never evidence of disease. In the elderly, the sound is commonly much lower in pitch; in them a short valvular first sound is, I believe, significant of a weakened myocardium.

The occurrence of a third heart sound in early diastole constitutes the only ausculatory abnormality heard over some dilated and failing hearts. This produces the so-called protodiastolic gallop rhythm, often so significant of the onset of myocardial insufficiency in a patient with hypertension and previously competent, hypertrophied left ventricle, as well as in cases of aortic insufficiency and mitral disease. While important evidence of pathological dilatation in such persons, Thayer* has shown that it is very common in young persons with entirely normal hearts, when examined in the recumbent or left lateral postures. This must always be borne in mind, and no special significance attached to it in the absence of enlargement of the heart.

Alterations of the cardiac rate and rhythm are now the subject of a large and increasing literature. I can only allude here to the significance of a few of the slighter variations from the normal which may be misinterpreted. The most frequent of these is that irregularity which consists in a quickening of the rate at the start of inspiration and slowing at the start of expiration. This respiratory variation in the normal sinus rhythm is common in the young, and has been called by Mackenzie "the youthful type of irregularity". I have known children to be put to bed for weeks because of this practically normal occurrence. It is much rarer in adults, but does occur, and merely signifies heightened variation in vagus tone. It is sometimes conspicuous in patients with meningitis. For the heart, it is of no moment whatever. The occurrence of occasional dropped or premature beats most of us are familiar with from our personal experience. They may accompany gross disease of the heart, especially in the elderly with hypertension or arteriosclerosis. They do signify some abnormality of irritability or stimulus formation, but of themselves they indicate nothing as to the essential integrity of the heart's structure or function as a pump. If the heart is in other respects normal, and the individual capable of normal response to effort for his years, they may be disregarded. A persistent rate above the normal, even if this be not high, calls for careful study. While it is found with slight myocardial insufficiency, it more often signifies an undiscovered infection usually tuberculosis, or hyperthyroidism. The latter is particularly to be suspected when the rate does not fall with rest in bed.

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* *Arch. Int. Med.*, 1909, iv, 297.

I wish to call particular attention to the importance of determining the response of the circulation to exercise as the best guide to the significance of cardiac abnormalities. Where patients do not complain of any cardiac symptoms, or where the examination is to determine the existence of a state of health, as in examining for the army or for life insurance, an excellent test is hopping vigourously one hundred times. If the heart rate be counted before the exercise, and then with the stethoscope after the exercise, first erect, and then after two minutes' recumbent, much information of value may be obtained. A normal heart should settle down to near its former rate after two minutes' rest in the recumbent position, even though it be considerably hurried immediately after the effort, and the breathing should do likewise. Such a test is clearly not applicable to old people.

To an entirely different category belong those cases with objectively normal hearts, who complain of substernal discomfort, oppression or pain on exertion. It is a very common mistake to consider that the normal findings on physical examination render such symptoms of no significance. I believe that quite the contrary is the case, particularly in the elderly. Any patient who, on walking a few blocks, or taking a slight hill, or hurrying a short distance, fairly regularly finds himself obliged to slow down or stand still because of a sense of tightness or weight on his chest, or a constriction in the throat, or a dull ache in his arm or wrist, or any of the other variants of the sternocardial syndrome, is suffering from anginoid attacks, no matter what the physical examination discloses. If he has a positive Wassermann reaction and some dilatation of his aortic arch, his disease is syphilis of the aorta; if not, it may be sclerosis of the aorta or of the coronary arteries, or whatever is the unknown condition underlying angina pectoris. But neither syphilis of the aorta nor coronary sclerosis is angina pectoris. It is a symptom, not a lesion; a symptom which must be recognized in most cases from the patient's story, and when recognized has an unmistakable significance. That significance is the danger of sudden death. This may never occur in the individual case. It may be deferred for many years. The symptom may even disappear under appropriate management, but, once it has occurred, the prognosis must always be qualified by the recognition of this dramatic possibility.

Turning now to the arteries, I am impressed with the failure of most physicians to recognize the natural changes which occur in them as a result of the normal activities of life. It is perfectly clear, even to the casual observer, that the arteries of the healthy adult are larger and thicker walled than those of the child. Thayer and Fabyan * have demonstrated it conclusively. Professor Adami has made you familiar with this view. To speak of every palpable radial artery in a man of fifty as evidence of arteriosclerosis is absurd. The difficulty lies in determining what degree of change in the arterial wall shall be considered pathological at any particular life-period. I think we may assume that before the fourth decade the radial arteries are never easily palpable when emptied of their blood without being pathological. In the fourth and fifth decades, some thickness of the wall is recognizable in practically every man, and considerably more in those who have done heavy physical labour. After the fifth decade, the arteries often begin to widen and elongate, showing slight tortuosity, and this tendency becomes more evident with advancing years. This is Allbutt's "decrescent arteriosclerosis". It can only be considered pathological if one considers old age and death as pathological. On the other hand, when it occurs in markedly exaggerated degree for the patient's age, it may then be spoken of as arteriosclerosis in the sense of a disease. In the very aged, extensive calcification is practically invariable, but I doubt if this should be considered unimportant in persons under eighty. Another fact not universally recognized is that this change in the accessible larger blood vessels is of very little significance for the circulation. Arteriosclerosis is dangerous only when it involves the arteries of vital organs in such a way as to compromise the circulation through them. This may happen with little or no sclerosis of the radial artery. The important circulatory areas, from this standpoint, are the cerebral, renal, and coronary vessels, and the retinal vessels, which alone may be directly inspected. With the latter exception, sclerosis of these important vascular districts must be inferred from its resultant disorders of function, not detected by anatomical evidence.

Like the arteries, the blood pressure shows a definite change in a single direction throughout life. Starting with a systolic arterial pressure below eighty in infancy, it rises during early childhood to about one hundred, by puberty to about one hundred

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* *Am. Jour. Med. Sc.*, 1907, xxxiv, 811.

and fifteen, and then throughout each decade of adult life to an average of one hundred and thirty-five at sixty. In women it is regularly somewhat lower. Individual variations carry the possible normal still further, but it is wise to assume that a pressure above one hundred and thirty-five millimetres systolic in younger men, and above one hundred and forty-five millimetres in the elderly is abnormal. This abnormality may be temporary. Should it prove permanent, the question of its significance arises. Here the measurement of the diastolic pressure assumes much importance. Slight degrees of hypertension, with the systolic pressure between one hundred and sixty and one hundred and eighty, and the diastolic pressure not above one hundred, may, I believe, be dependent upon arteriosclerosis of the aorta and larger arteries. When the pressure is higher than this, however, and especially when the diastolic pressure is one hundred and ten or over, I believe it entirely erroneous to speak of arteriosclerosis as the cause, and it should be remembered that arteriosclerosis may exist in the most extreme degree without special effect upon the blood pressure. Hypertension, especially if the diastolic pressure be raised, even in the absence of any other evidence of circulatory or renal disease, signifies that type of disease of heart, arteries and kidneys which is so common and yet for which we have no single universally accepted name. It is perhaps most in accordance with the facts, when hypertension is the sole symptom, to call it merely hypertension. Whether the end picture which will develop from it shall be that of chronic renal disease, or cerebral arteriosclerosis, or of myocardial insufficiency, is a prognosis which can rarely be made until the symptoms of advancing implication of one or the other of these organs manifest themselves. That it signifies the beginning of changes in the arterioles which will lead to one or the other of these is clear. That it may be well borne for years, in my opinion, forbids us to call it Bright's disease or chronic nephritis, any more than we would call it apoplexy, or hemiplegia, or infarction of the heart, or any other of its possible anatomical end-results.

In the examination of the lungs the important practical problem is the determination of just what variations from the normal constitute valid evidence of the existence of clinical tuberculosis. I say clinical tuberculosis advisedly. Except in young children, the recognition of infection with tuberculosis is an academic, and not a practical, problem. It cannot be too strongly insisted that the business of the physician is to determine whether a patient is ill because of tuberculosis, or has been ill because of tuberculosis and must be safeguarded against possible future recurrence. An immense amount of time and ingenuity have been devoted to the refinement of the physical examination of the lungs by percussion and auscultation, and the recording of minute deviations from the normal. I wish to emphasize here my conviction that much of this time has been wasted. I would not for a moment be understood as advising against the careful physical exploration of the lungs. What I have in mind is the type of examination which records minute differences in the percussion note and in the character of the breath-sounds at the apices or elsewhere, without appreciation of the sharp limitations of the methods used. Differences in the thickness or the tension of the muscles on the two sides will produce definite changes in the percussion note. Breath and voice sounds are normally louder and more tubular at the right apex than the left, because of the relation of this to the trachea. Very great experience in the possible range of normal variation in different types of individual, thin and fat, young and old, with flexible or with rigid thorax, with heavy or with slight musculature, large-lunged and small-lunged, all these and many more affect the physical signs and require that the observer have in his mind, not a single normal standard, but the right standard for the particular individual selected from his memories of hundreds of varying normals. This is manifestly impossible except for the expert who has given much time to this particular problem, and he may easily be misled. Outspoken dullness, distinct local enfeeblement of otherwise normal breath-sounds, definite tubular breathing in an area where the sounds should be vesicular, localized moist râles, all of these in appropriate situations are of great significance in a patient who has any symptoms suggesting pulmonary tuberculosis. Given a quiet room, an intelligent, coöperative patient, and a reasonable proficiency in percussion and auscultation, and these should be detected with ease in fifteen minutes, or the examination is not worth continuing. In a noisy room, or with an uncoöperative patient, or without reasonable proficiency on the part of the examiner, the physical exploration of the lungs should not be attempted at all, and the diagnosis made tentatively from the much more important symptoms and corroborated at a suitable opportunity or by a suitable consultant.

Similar objections may be urged against the minute scrutiny of radiographs for the detection of pulmonary tuberculosis. The radiograph may give valuable confirmatory evidence. It can never make anything but an anatomical diagnosis of probable tuberculous lesions, whether these are recent or very old, and whether they have anything to do with existing symptoms is a problem for the physician in consultation with the rœntgenologist. Nowhere in medicine does the myth of an ideal perfection, never found in the domain of the actual, hold such sway as in the interpretation of radiographs of the lungs. Just as many decades, and their comparison with the lesions found at thousands of autopsies, were required to determine the actual significance of all of the abnormal signs found by auscultation and percussion, so must we expect knowledge of the meaning of the slighter variations in the shadows at the roots of the lungs to be laboriously acquired. There is no other road to it, and least of all is the *a priori* assumption justified that such shadows are abnormal and necessarily indicate tuberculosis. Comparison with physical signs in clinical cases cannot solve this, because the signs are inadequate and themselves capable of misinterpretation.

The gastro-intestinal tract furnishes one of the best examples of the great range of normal variations in form and position. Our knowledge of this we owe to rœntgenology. The method of direct examination of the living and functioning stomach and intestines by the opaque bismuth or barium meal has shown how erroneous were our anatomical conceptions based on the examination of the dead subject. Here again, the relation of the form and position of an organ to the general body form is well illustrated, the so-called cow-horn stomach occurring in the stout, the fish-hook or vertical stomach in the long and thin. Rœntgenologists have learned that, while this latter type of stomach may have mechanical disadvantages, it is not abnormal, nor in itself evidence of gastroptosis in an individual of this build. Whether we shall hold this bodily configuration as significant of physical inferiority is another question, into which I shall not enter.

In the time that remains, I should like to call your attention to certain easily overlooked symptoms which have considerable significance in the diagnosis of diseases of the kidney, and to a few problems in the interpretation of slight functional impairments as revealed by special tests. For a number of years I have been impressed with the occurrence of nocturnal frequency of urination early in the course of chronic renal disease. This is no new observation, but the studies of Schlayer,* of Mosenthal† in our clinic, and others, have given it a much more precise significance. One of the first evidences of impairment of renal function is a slight inability to vary the concentration of the urine. The field of response of the kidney to the ordinary diuretic stimuli, water, sodium chloride, urea, becomes limited. The expression of this which we can detect the most simply is fixation of specific gravity. Normally, this should vary throughout the day in the separate samples passed by as much as eight points, and is highest, 1018 or over, in the diminished volume of urine passed during the night, when no water is drunk. With advancing impairment of the kidney's ability to respond to the varying functional demands upon it, comes an increasing fixation of the specific gravity, and with further progress of the functional damage, fixation at a lower and lower level, that is, failure to excrete a concentrated urine. This leads to a greater uniformity in the rate of secretion throughout the twenty-four hours, and thus to an increase in the volume of the night urine, which the patient notices as the need to get up and pass urine once or more during the night. When patients do not take a large amount of fluid at bed-time, this nocturia is a most significant symptom and should lead at once to an investigation of the renal function so readily caried out by the test-meals devised by Mosenthal. The sulphonephenolphthalein test of Rowntree and Geraghty* is also very simple of application. At times one meets with patients in the earlier stages of chronic Bright's disease in whom the excretion of 'phthalein in two hours is more than 80 per cent. From this it should not be inferred that the kidneys are maximally normal. This hyperpermeability is rather an unusual early evidence of disease, the explanation of which is not quite clear. A similar phenomenon is seen in connexion with the urea excretion as studied by the Ambard's coefficient. Dr. Lewis, who came to us from your Royal Victoria Hospital for two years, and to whom I said good-bye with so much regret when he left to join the Canadian Expeditionary Force a year ago, published a very interesting series of such cases from our clinic.† In a somewhat similar way polyuria may be an expression of over-response to stimuli on the part of the renal vessels in the early stages of a chronic nephritis.

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* *Deutsch Arch. f. klin. Med.*, 1911, cii, 311.

† *Arch. Int. Med.*, 1915, xvi, 733.

Of all the abnormalities which have been made criteria for the existence of chronic renal disease, the traditional albuminuria is the most fallacious. Not that the presence of albumin and casts is not common in renal disease of certain types, but that such marked albuminuria occurs without permanent lesions of the kidney in postural albuminuria and in chronic passive congestion, and because it is so commonly absent in one of the most important types of chronic Bright's disease, the so-called primary contracted kidney. For no other organ of the body does the interpretation of the significance of abnormalities of function demand the study of associated disturbances and lesions in remote organs and the combination of evidence derived from so many sources as for the kidney. It is not enough to detect abnormal constituents in the urine and an abnormal renal function, but heart and arteries, blood pressure, eye-grounds and central nervous system, must all be investigated and the prognosis based on the combined findings.

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* *Jour. Phar. and Exp. Therap.*, 1910, i, 579.

† *Arch. Int. Med.*, 1917, xix, 1.

Time and a decent respect for your endurance forbid that I should allude to many other interesting aspects of the subject. Conscious as I am of the sketchy incompleteness of my presentation, I can only trust that your personal experience has already filled in the many gaps. To-day, more than ever, physicians are called on to solve concrete problems of pressing urgency. If I have shed light on the nature of any of those problems or afforded the least help in their solution, I shall be happy.

Gentlemen, I am more happy that I have been privileged to meet with you this notable year in which our two nations have united in a common cause. For more than a hundred years they have lived as good neighbours in the friendly rivalries of peace. Now we have determined to join with you in the grim but glorious comradeship of war, in defence of our common heritage and our common aspirations. The medical profession has its special stake and its peculiar part in the stuggle. When hospital ships are sunk and the Red Cross marks its wearer for destruction, then is the axe laid at the very root and motive of our art. Surely divine pity is that root, and science merely the tool with which we work. Pity without science is powerless to help, but science without pity has shown itself unbelievably potent for harm. You of the Canadian profession have borne the burden and heat of the day with a nobility to which no words of mine can pay a fitting tribute. Accept my inarticulate homage. May we not fail to meet the test, and, shoulder to shoulder with you, endure that victory of justice and mercy which alone can bring an enduring peace.

THE CORPUS CALLOSUM—A MORPHOLOGICAL AND CLINICAL STUDY

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I. *Morphological*

THE corpus callosum is a portion of the human brain which is treated in many text-books of anatomy in the briefest possible manner. The main purpose of this paper, therefore, is to demonstrate the fact that this structure is really of the greatest importance and significance, not merely from the morphological, but also from the clinical, physiological, and psychological standpoints. For example, its presence exclusively in the higher mammalia provides zoologists with a very satisfactory and effective means of dividing this, the highest class of vertebrates, into two distinct and decided sub-classes—the callosal and the a-callosal mammals. This fact alone confers upon it a position of the greatest morphological importance. This comparatively late appearance of the corpus callosum as we proceed up the vertebrate scale, is reflected in its ontogeny, for it is the last of the three commissures of the fore brain to develop in the human embryo, not manifesting itself until the fourth month of intrauterine life.

If one examines the corpus callosum of an animal belonging to the order Edentata, which is generally regarded as probably the lowest group of callosal mammals, it will be observed to be a very thin structure, so thin indeed in some instances as almost to be called membranous. If one proceeds up the group and examines the stage of evolution this structure has reached in the rabbit, which is a readily accessible representative of the group Rodentia, it will be observed on making a mesial section of the brain, which by the way is the most convenient method of studying the relative degree of development of the corpus callosum, that though only slightly better manifested than in the Edentata, it is still com-

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paratively thin. In the order Carnivora, which represent a very decided step in evolution, the growth of the corpus callosum exhibits very pronounced progress, while in the order Primates, the highest in the mammalian scale, this structure, as one would expect, reaches its greatest degree of development. The main outcome of these researches is, that in the lowest orders of callosal mammals, where the surface of the cerebral hemispheres is *smooth and free from convolutions*, the corpus callosum is *very feebly developed*, whereas in the highest orders, where the hemispheres show a progressive increase in the amount of convoluting of the grey matter, there is a *concomitant increase* in the size of the corpus callosum.

On applying the results of these investigations in comparative anatomy to the case of man, I found, as one would expect, that the more richly convoluted the brain, the greater was the degree of development of the corpus callosum. It may be noted in passing that the convoluting of the surface of the hemispheres increases the area of grey matter about three times. This constitutes a remarkable increase of surface area. It is therefore a significant fact that an individual with a large head does not necessarily possess a correspondingly high degree of intellectual development. The latter, as my researches show, seems to be mainly due to the amount of convoluting which the grey matter undergoes. It is thus possible for an individual with a relatively small head to be very brilliant mentally. Moreover it was ascertained that the corpus callosum was not large, either relatively or absolutely, in big brains that were not elaborately convoluted. On the other hand it was found to exhibit a robust degree of development in small brains that were richly convoluted. It is clear, therefore, both from the comparative anatomy of the corpus callosum in lower animals and also from an investigation of its anatomy in man, that the degree of development of this structure is essentially due to the extent of the area of grey matter possessed by the individual. This demonstrates very definitely the fact that each new area of grey matter produced during the evolutionary process has to become connected across the mesial plane through the callosal system with its fellow and possibly also with other districts as well.

The above observations are of importance when considered in association with the recorded brain weights of eminent men. On choosing names from opposite ends of the list it will be found that the brain of Cuvier, the famous French biologist, weighed 1830 grammes, while that of Hughes Bennett, a distinguished Scottish physician and physiologist, was only 1332 grammes,[1] which, it may be noted, was decidedly below the average for the male Caucasian which Welcher gave as 1390 grammes.[2] These extreme variations in the brain weights of admittedly brilliant individuals surely confirm my statement that it is not so much a question of size as of the amount of convoluting.

My investigations also agree in many ways with the results of the recent researches of Spitzka[3] on the corpus callosum. This investigator found that the area of this commissure in sagittal section was unusually large in the brains of individuals with recognised intellectual superiority. He further declared that the size of the corpus callosum possessed a direct relationship to the degree of intellectual superiority which the individual was known to be gifted with. The recent researches of Bean,[4] however, challenge the constancy of that relationship. This observer points out that callosal systems of unusual size certainly belong to brains which possess a weight above the normal; but he goes on to show that large brains are sometimes found in individuals of average or even of inferior intellect. The results of these two investigators further serve to confirm my assertion that it is the degree of convoluting that counts and not the weight.

On looking up the literature of the subject, I was surprised to find the average thickness of the posterior end of the corpus callosum (the splenium) given as 8 m.m.[5] In the specimens examined by me this worked out at about 12 m.m., but in making such a calculation one would of course have to examine many hundreds of specimens.

II. *Effects of Absence of the Corpus Callosum*

Absence of the human corpus callosum is a very rare anomaly, as is to be expected, if one may judge from the time of appearance of this commissure in mammalian phylogeny. For example, Bruce[6] found that up to 1888 only fifteen cases of *complete* deficiency of this structure had been recorded. It was therefore with feelings of gratification that the writer in 1907 discovered a brain which exhibited a complete absence of the corpus callosum. I need not dwell here on those points in this specimen which were purely of morphological interest and were previously published elsewhere.[7] It displayed, however, several features which are worthy of being recorded in a clinical journal. For example, the sulci exhibited a remarkably simplified arrangement such as one would expect to encounter in primitive brains. The right fissure of Rolando existed in the form of its two constituent portions, as found in the fœtus. Another sign of cerebral inferiority was the relatively high degree of development of the rhinencephalon, which, as is well known becomes more and more the dominating part of the fore brain, the lower we descend the animal scale. The lateral ventricles were abnormally capacious, so much indeed as almost to suggest a hydrocephalic condition. In fact the late Sir William Turner[8] advanced this as a possible explanation of the arrest in the development of the corpus callosum. It must be recollected, however, that the fibres of the callosal system form the immediate roof for each lateral ventricle, and the absence of these fibres would of course have the effect of causing the cavities to appear more capacious than normal. As stated in my paper "the increased capacity, from this point of view, is thus, partly at least, the result of a general deficiency of the corpus callosum; though this conclusion does not entirely put out of court the possible existence of a concomitant hydrocephalic condition".

The importance of the corpus callosum as an essential functioning constituent of the human brain is shown by the fact that its absence is associated with signs of grave mental deficiency in the individual. Some of the cases of partial absence did not exhibit any very serious departure from the normal though they were classed by their acquaintances as "queer", a very unscientific description which does not help us much. So far as one can gather from the recorded cases of complete absence of the corpus callosum, the clinical features, where known, did not conform to any special clinical type of insanity, but represented rather a condition of general feeble-mindedness. Of course one would argue from the physiological standpoint that in absence of this commissure the chief loss would be a lack of coördination between the two halves of the brain, which must have produced a remarkable train of symptoms in the individual. So far as I can ascertain, no elaborate account of the clinical history of these cases has been published. I would like to prophesy that such a contribution would form a valuable addition to our knowledge of some of the obscure problems of neurology. I would therefore urge the necessity of making post-mortem examinations in our lunatic asylums on all obscure cases of dementia, paying particular attention to the condition of the corpus callosum, as it is possible that absence, or at any rate deficiency of this structure, occurs more frequently than is generally recognized.

III. Clinical Considerations

Apparently a great deal of dubiety still exists as to the exact extent and scope of the functions of the corpus callosum. Thus Dana[9] states that it is "the great commissural tract connecting the two cerebral hemispheres and their respective centres", though he qualifies this assertion somewhat by the statement that those centres of each hemisphere "for receiving visual impressions are almost independent, and the centres for the memories, which are still more highly specialized, are practically entirely independent. We infer that the higher mental functions, therefore, work either in one hemisphere or in the other, and that the two halves of the brain do not coöperate with each other in much of the higher intellectual work." It is interesting to compare this statement with the opinion of Bastian[10] who remarks that "the more specialized emotional, intellectual, and volitional regions in each hemisphere, wherever they may be, and however they may be related to one another, are necessarily, by means of the 'association system' of fibres, brought into intimate communion with their corresponding sensorial regions of various kinds. It is in this way, therefore, that the higher functional regions of the two hemispheres may be brought into relation with one another through the medium of the fibres of the corpus callosum. There is manifestly a unity in our sensorial consciousness, that is, in the 'derivative', as well as in the 'primary' mental processes." It is clear that the opinions of these two authorities are diametrically opposed to one another and require some elucidation. It seemed to me that much of this could be secured from the anatomical standpoint, by making a simultaneous dissection of the white matter of each hemisphere. I accordingly decided to strip away the white matter from above downwards layer by layer. This will be found to be a successful method in formalin hardened brains, in which the centrum ovale can be readily split off in layers.[11] Each layer or strip must be pulled away gently by dissecting forceps. The various bundles of fibres exposed on each torn surface stand out like fluted columns, a fact which permits of their being readily traced to the area of grey matter from which they arise. After much labour it was ascertained that every district of grey matter sent its quota of fibres into the callosal system, and these in due course found their way across the middle line to the opposite hemisphere. I was particularly impressed by the prominence of the bundles of fibres which swept across between the frontal regions of the hemispheres in the genu (forming the forceps anterior of the corpus callosum), and also by the closely packed arrangement of the fibres passing between the two occipital poles in the splenium (forming the forceps posterior). The splenium and the genu, it may be noted, constitute the thickest portions of the corpus callosum. It is thus significant to observe that the higher intellectual centres of the frontal lobes and the visual centres of the occipital lobes are concented with one another across the mesial plane in the most elaborate and, indeed, lavish manner possible. It is therefore clear that the results of these researches are definitely antagonistic to Dana's views and on the other hand confirm Bastian's opinion.

The corpus callosum has an important bearing on the subject of apraxia,[12] for it has been definitely shown that a lesion affecting this structure causes at least one form of that interesting condition. The problems involved in apraxia have not yet been fully elucidated; but the chief manifestation is a failure to coördinate the movements of the extremities, especially the hands, in the production of a definite ordered movement, which demands the conjoint use of both, as in the bimanual manipulation of a utensil or implement. For example[13] apraxia of the left hand, may be observed even when its sensori-motor area in the right hemisphere is absolutely intact. This puzzling condition is sometimes found to be due to its connexion with the corresponding centre in the left hemisphere having been severed by a lesion in the corpus callosum. This interesting and significant fact shows that the left sensori-motor centres in a right handed individual possess or exercise a functional superiority or supervision over the corresponding ones of the right hemisphere through the callosal system of intercommunicating fibres. This fact has probably been responsible for the prevalence of the idea that the "speech centre" is located entirely in the left hemisphere in a right handed person. I therefore am convinced that the doctrine of incoördinate simultaneous innervation can also be applied to the speech function. One certainly ought never to lose sight of the fact that the left halves of the tongue, mouth, soft palate, fauces, pharynx, and larynx, which are all implicated in the production of voice and speech are innervated from the right hemisphere. The commissural fibres of the callosal system that connect the "speech centre" of Broca with the corresponding area of grey matter in the right hemisphere will be found on careful dissection to be as strongly developed as the bundles connecting other areas. One ought therefore to describe "speech centres" in both hemispheres, with a system of callosal commissural fibres connecting these together in the most intimate manner possible, and apparently exercising some control by the left centres over the right in a right handed person. I am glad to see in the writing of some of the younger neurologists expressions of dissatisfaction with the localization of the speech centre exclusively in one hemisphere, as this unilateral arrangement has clearly failed to explain many obscure clinical phenomena associated with disorders of speech. For example, Marie,[14] as the result of extensive investigations on the subject, has made the startling declaration that Broca's convolution is not associated with the speech function at all. Moreover, he further asserts that in true aphasia a general impairment of the intellectual functions is invariably present. Marie considers, and I think rightly, that the idea of intellectual impairment ought never to be lost sight of, as possibly influencing or even dominating the aphasic condition.

Monakow's[15] conclusions on the subject of aphasia are likewise of great significance. This investigator also questions the localization of the speech centre in Broca's convolution, and considers that aphasia is due rather to a loss of continuity—a *diaschisis* as he terms it—between the various centres that control the speech mechanism. The coördinated action of these centres in the two hemispheres can, I take it, only be brought about by the efficiency of the callosal system of projection fibres. The results of these two investigators are certainly pregnant with suggestiveness, and will, I venture to remark, revolutionize our present day ideas regarding the anatomy and physiology of the language mechanism. I have attempted to come to the rescue, as it were, from the purely anatomical standpoint, in the hope that it may assist in clearing up some of these obscure clinical manifestations.

The corpus callosum is generally treated with scant courtesy in text-books of anatomy. One object, therefore, of this paper is to vindicate the position of this commissure as a highly important unit of the human cerebral organization. Another object, and that by no means the least important, in publishing this paper in a clinical journal, is to advance a plea in favour of closer coöperation between the clinician and the anatomist in the attempt to elucidate obscure problems that are encountered in daily medical and surgical practice.

References:

1. These weights are given in Doctor Charlton Bastian's book—"The Brain as an Organ of Mind."

2. In a recent paper Bean gives this as 1341 grammes. *Amer. Jour. of Anatomy*, Vol. IV.

3. *Amer. Jour. of Anatomy*, vol. iv.

4. *Amer. Jour. of Anatomy*, vol. v.

5. Piersol's "Anatomy," p. 1155.

6. *Proc. Roy. Soc. Edin.*, vol. xv. Also in *Brain*, vol. xii.

7. *Jour. of Anat. and Physiol.*, vol. xli.

8. *Jour. of Anat. and Physiol.*, vol. xii.

9. "Diseases of the Nervous System," 4th Ed., p. 373. This is the latest edition I have been able to gain access to. It is possible that the author may have considerably altered his views in a later edition.

10. "The Brain as an Organ of Mind," p. 485.

11. At the International Congress of Anatomy at Geneva, in 1905, Doctor E. B. Jamieson exhibited a beautiful series of dissections of the brain carried out in this manner.

12. This subject will be found discussed in Bing's "Compendium of Regional Diagnosis in Affections of the Brain and Spinal Cord," p. 200.

13. This of course has reference to a right handed individual. Apraxia of the right hand would under similar circumstances be the condition in a left handed person.

14. *La Semaine Médicale*, May 23rd, October 17th, and November 28th, 1906.

15. *Neurologisches Centralblatt*, November 16th, 1906.

THE Mount Hamilton Hospital was opened officially on Saturday afternoon, May 19th, by His Excellency the Governor General, who was accompanied by Lady Maude Cavendish. It is the intention that, eventually, the hospital shall comprise ten units, but at present one only—the medical building—has been completed. A beautiful site on the Hamilton Mountain was wisely chosen for the hospital and nothing has been forgotten in its equipment, which is of the latest design. The building itself is of rough texture brick and reinforced concrete and, of course, is fire proof throughout; the water supply is pumped through the building by electricity, the nurses call system is silent and the illumination both direct and indirect. Dr. Langrill, the medical superintendent, and those who have worked with him so faithfully are to be congratulated upon the results achieved.

PYELITIS

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PYELITIS is coming to be recognized as an important disease, *sui generis*, and to be accorded its place as a definite entity. This is borne out clearly by tracing its history through the literature of kidney diseases for the past ten years.

It had long been known as a secondary process associated with renal calculi, tuberculosis, or following instrumentation, but it remained for Reblavd, Lohlein, Olshavsen and Rosving to place it before us on a definite clinical basis as an independent lesion.

Lindeman, in 1913, in the *Deutsche Zeitschrift für Chirurgie* in a masterly exposition of the subject pointed out clearly how deficient our knowledge is, of the varying and more or less changing symptoms in the acute and chronic inflammations of the pelvis of the kidney; and, therefore, how difficult is their diagnosis. He also emphasized the great difference in the valuations placed on the various therapeutic measures; whereas in a certain group of cases the drink cures together with urinary antiseptics would yield good results, in another series these measures would fail. Likewise a series treated by topical applications to seat of disease would yield very unequal results.

Just these contradictory features have attracted many workers to this field and have prompted many researches. And even though our knowledge has already advanced by tremendous strides it is far from settled and complete.

In the majority of cases we are dealing with an infection by the bacilli coli or members of its group and only in a few instances, other organisms of pathogenic or non-pathogenic nature have been found. Lindeman, in a large series, finds bacillus coli in 81 per cent. of cases; the remaining 19 per cent. showing staphylococcus, streptcoccus, bacillus proteus, pneumococcus, bacillus typhosus, or gonococcus. In our own experience the colon bacillus was the infecting organism in 90 per cent. of cases.

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Accordingly this brings us to consider briefly the sources from which these organisms come. About this subject controversy has been active for years and is yet unsettled. Infection is commonly regarded as occurring in one of three ways: i.e., from the blood stream, the hæmatogenous or descending route; secondly, by the lymph channels from the large bowel; or, thirdly, by the so-called ascending infection, that is by means of the ureter.

At the outset it may be well to point out that the bacillus coli is a constant inhabitant of the body, and enters sometimes through the healthy skin or by way of mouth, nose, anus, vulva or urethra and that its presence can be demonstrated in the ramifications of respiratory digestive or urogenital systems, at times without any apparent inflammation. It seems probable that even in health, it may enter, in small numbers, these organs, when they are apparently unchanged, and that it may pass from the bowel into the mesenteric glands, liver, spleen, or kidney; and that it filters through the kidney and may appear in the urine. We are also aware that bacillus coli under suitable conditions may cause pathological lesions such as urethritis, cystitis, vesiculitis, orchitis, epididymitis, puerpural fever, endometritis, salpingitis, cholecystitis, peritonitis, and bony infections, and thus realize the possibilities of metastatic infection.

At this time it would not be advisable or possible to delve deeply into the controversial side of the subject, but from a clinical standpoint it might be well to state some of the chief evidence relating to these matters. In the early days, Rosving and his school adhered strongly to the hæmatogeneous or descending method of infection, insisting that cystitis and colipyelitis originated entirely by the blood routes. Since then these views have been modified and both the hæmatogenous and ascending modes of infection have been given credence.

We are all agreed that much clinical and experimental data are at hand to enhance the views of ascending infection either by way of the ureteric canal or by the lymphatics which surround it. For instance Guyon, Lewin and Goldschmidt have shown that excessive vesical pressure releases temporarily the valvular closure of the ureter at its entrance into the bladder, making it possible for the bladder contents to regurgitate into the ureter. They may then be carried by antiperistalsis to the kidney.

Such conditions are produced by tumours and enlarged prostates, stones, strictures and also by strong bladder irrigations such as with strong silver nitrate as practised in gonorrhœal infections.

What happens is that marked bladder tenesmus results after silver lavage, the bladder contracts repeatedly and its contents are forced into the ureter and so, possibly, on to the bladder. In women moveable kidneys, abnormal courses of the ureter, with parametric adhesions, lead to kinking and twisting of ureters and urinary stasis and decomposition, leading to infection. But here the question as to whether we are dealing with an ascending infection or hæmatogenous infection of stagnant urine is difficult to decide.

Eisendrath and Schultz, of Chicago, have recently published a very interesting study supporting the "ascending infection and point out that there is a very close lymphatic network in the wall of bladder and ureter, communicating above with a similar one about the pelvis and parenchyma. At its lower end connexions with pelvic viscera are clearly demonstrable. Experimental and clinical evidence indicate that almost complete obstruction to free passage of urine is necessary for ascent of infection by lumen of ureter. Experimentally, it may be shown that infection set up by simple introduction of bacteria into the bladder without injury obstruction may pass by up means of mural lymphatics of ureter, and he concludes by saying that in pyelitis and pyelonephritis in the human, second to the bladder the lymphatics constitute the most important course of upward travel especially where there is no urinary obstruction.

It is almost unnecessary to draw attention to the frequency with which the condition occurs in pregnancy. Opitz, in a review of eighty-five cases, states that he believes that in the majority there is pressure by the uterus on the right ureter producing sufficient obstruction to cause a chronic urinary stasis in the pelvis and that then infection supervenes.

Others suggest the possibility of traction or stretching of the ureteric orifices with similar results. Frome insists that the enlarging uterus turning always to the right presses on the linea innominata and subsequently on the ureter. In any case it is a well-known clinical fact, that this condition is most frequent in pregnancy and occurs just at the time when the greatest circumference of the uterus is at the level of pelvic brim; and we also know that in the presence of this infection beneficial effects always accrue from instructing the patient to lie constantly on the sound side establishing free drainage.

In consideration of the descending or blood route of infection we may justly point to its occurrence in the following: tonsillitis, influenza, septicæmia, scarlet fever, rheumatism, bronchitis, pneumonia and pleurisy, especially in children. Added to this we have the observations of the French school who adhere strongly to the bacterial origin of the nephridites suggesting from within a possible source of the infection.

Infection by means of the lymphatic connexion of the kidney with the surrounding viscera has received a great deal of consideration of late, largely through the classical work of Carl Franke who was able to demonstrate by injection methods an absolute lymphatic connexion between the ascending colon and the kidney capsule. Miller enhanced the value of this demonstration by showing the connexion of the kidney lymphatics with those of the capsule, thereby establishing a straight connexion between the bowel and kidney. One might do well by quoting Franke's conclusions in this regard. He says, "on the right side communications are possible, the direction of the lymph flow is from the intestine to kidney, as the vessels could only be filled up from the intestines and in no case not even in a small part, was it possible to inject the tract from the kidney side." In connexion with this I might mention the clinical observation that pyelitis is more frequent on the right than on the left side.

At this juncture a personal observation may be also of value. In dissections of this region I have observed that the duodenum, particularly at the site of Vater's papilla, is in very close apposition and in direct attachment with the kidney capsule and that, therefore, infected bile moving about this point could be readily transported through the lymphatics to the kidney. We are at present engaged in a study of this lymphatic course.

There does not appear to be any doubt in the minds of modern observers that the lymphogenous route should receive careful consideration. This is strengthened by the repeated observation that pyelitis is so often preceded or accompanied by some lesion in the large bowel such as colitis, or other lesions.

Of all the conditions likely to predispose to this state one would naturally lay emphasis on *constipation*. In nearly every instance of this infection, notably in adults, it is possible to demonstrate the presence of constipation either preceding or accompanying the condition, and repeated observation has borne witness to the fact that recurrences, or relapses, in the course of the disease occur largely with attacks of constipation or obstruction. One cannot emphasize this fact too strongly when the question of treatment is considered.

It is interesting to recall here the animal experiment in which after the administration of opium for several days causing paresis of the gut, living bacillus coli could be isolated from the mesenteric glands, animal controls at the same time showing negative results. This would appear to show the possible course taken by these organisms in man.

In the case of children one is impressed with the frequent association of pyelitis with attacks of enteritis and in the usual summer epidemics it has been customary for bacteriologists to emphasize the almost constant presence of organisms of this family in the urine. At the same time pediatrists are frequently quoting the instances of the development, notably in girls, of a cystitis with later a pyelitis, and they are of the belief that in this group the infection rises from fœcal contamination of the external genitalia and spread up through the urethra.

As to the anatomical changes underlying the clinical symptoms of pyelitis we would consider them only in so far as they appear to be of importance for the understanding of the whole condition, and as indications for treatment. The pelvis of the kidney is rarely affected severely in uncomplicated cases of pyelitis; there is generally intense hyperæmia or swelling, but such changes as ulceration are rare. In the very acute cases and in the earlier stages it is not unusual to find mild foci of infection in the papillæ of the kidney. We rarely expect perinephritis complications. Pyelography tends to divide these cases into three classes; those showing a normal outline of kidney pelvis, those with slight alterations, and lastly, those with marked changes, i.e., contractions. In this last group, fortunately small, the prognosis is bad.

From the above consideration of the ætiology of this condition we are prepared to accept the already mentioned fact that only in a minority of cases is a correct diagnosis made. We are frequently confronted with cases in which diagnosis of many kinds have been made and in which unnecessary operations have been performed such as appendectomy, with of course negative results.

Clinically the cases appear to fall readily into three classes: 1, in man; 2, the pregnant woman, and 3, in the female child. Typical examples of these would be found in the following cases.

MAN

Mr. A., admitted December 18th, complaining of pain in the right side, headache and constipation.

Personal History. Good. No gonorrhœa. In childhood typhoid and rheumatism.

Present Illness. One month ago patient took sick with pain in the right side of the abdomen more behind than in front. The pain was so severe that he could not sleep and lasted with that severity for several days. During that time he suffered from headaches and obstinate constipation; there was some fever, and sufficient prostation to confine him to bed. In the last week or so fever appeared and has persisted up till the time of admission. In the last day or so there has been some frequency of micturition. No cough or expectoration and no vomiting. On examination the heart and lungs were normal and, apart from slight tenderness in the right loin and an unduly sensitive kidney, the abdomen was negative. The urine was turbid, strongly acid in reaction, had a specific gravity of 1026, albumen marked, no sugar, no bile. Microscopically the sediment was found to contain many old and new pus cells, no casts or red blood cells. Cystoscopic examination showed a comparatively normal bladder mucosa. The ureteral orifices were normal. A catheter was cautiously carried up into each ureter a short distance, and the urine collected from each side. That from the left side was normal, from the right was turbid, of acid reaction, contained much pus and culturally gave a pure culture of bacillus coli.

Following this examination the temperature fell. He was kept in bed for almost a month in a half Fowler position on a low diet with purgation, forced liquids and the adminstration of urinary antiseptics such as urotropin. The condition subsided completely.

The following case is submitted to show the more chronic type met with and also the sometimes bilateral involvement.

Mr. J., age thirty-five, admitted complaining of pains in the back and over the bladder.

Present Illness. Six months ago whilst under treatment for an injury to his knee it was discovered that he was suffering from a pyuria. There were no symptoms, referable to the bladder or kidney. Two months later he developed pains in the back of a sharp stabbing character which would last several days and then disappear as rapidly as they had come. They did not radiate, always remaining, as he says, "in the small of his back". With the pain there were frequently fever, chilly sensations and a general feeling of malaise. Because of the increasing frequency of these attacks, he decided to come to the hospital for observation. On admission he was found to be a fairly well nourished man, in good condition. Heart and lungs normal. Examination of the abdomen did not reveal any abnormality. There was no tenderness in the kidney regions and no palpable masses. Tuberculin reactions were negative. The urine from the bladder was turbid, acid in reaction, showed high percentage of albumen, microscopically a large quantity of pus, but no blood or casts. Tubercle bacilli were frequently looked for but never found. Guinea pig inoculations were negative. *X*-ray did not reveal any abnormality. Cystoscopic examination showed slight congestion of the bladder base, some swelling about the ureteral orifices but no ulceration or tubercles. The urine from both sides was found to contain abundance of pus and the cultures from each side gave bacillus coli and staphylococcus. Treatment was not attempted.

The Pregnant Women

Mrs. M., age twenty-six, primapara, six months pregnant. Admitted to Royal Victoria Hospital, Montreal, complaining of pain in the right side.

Personal History. Had always been in good health, menses regular, the usual childhood diseases, married one year.

Present Illness. Four days prior to admission to the hospital she was suddenly seized with an attack of so called grippe characterized by headache, chilly sensation, fever and general malaise. She was confined to bed. On the fourth day she developed severe colicky pains over the entire abdomen. These increased during the day and a tentative diagnosis of appendicitis was made towards evening; accordingly she was transferred to the hospital. The following morning she felt better but spoke of tenderness in the right upper quadrant of the abdomen when she moved about or was touched and she stated that the pain was confined entirely to that region. There was never any vomiting, but nausea had been present from the beginning. Bowels were very costive and had been for some time. There were no urinary symptoms and there had not been any history of pelvic disease. The urine showed heavy grayish sediment with a strongly acid reaction, specific gravity of 1024, marked albumen, no sugar or bile. Microscopically many pus cells and short thick bacilli were found. Cultures of the urine gave a pure strain of bacillus coli. On physical examination the only abnormality found was the tenderness and muscle splinting in the region of the right kidney. Cystoscopic examination showed a normal bladder. The ureters were catheterized and the urine collected separately from each side. That from the left was normal; from the right it was found to be turbid, of a strongly acid reaction and contained a heavy deposit of pus, cultures showed a pure culture of bacillus coli. In this patient we adopted the postural treatment with rest in bed for three weeks associated with purgation, flushing out the kidney from above by forced liquids, and the administration of urotropin. The condition resolved satisfactorily at the end of that time.

Mrs. W., age thirty-two, seven months pregnant. Admitted to the Royal Victoria Hospital compaining of a dull pain in the right upper quadrant of the abdomen with frequency of micturition.

Personal History. Married two years, one child, normal delivery. Has always enjoyed good health, menstrual habit normal.

Present Illness. Dates back two months when she began to suffer at frequent intervals with attacks of fever, headaches, backaches and pains in the abdomen of a general character; with at times a feeling of general malaise. These attacks were never very severe and were usually transient in character. They have been recurring more frequently of late and have been followed by a sensation of fulness and soreness in the region of the right kidney, and she says that she frequently suffers from frequency of micturition followed by a burning sensation. She has been informed that her urine was comparatively normal apart from a few pus cells which were not considered unusual for the condition she was in. On admission to the hospital she was thoroughly examined and the only abnormality discovered was this pyuria of mild degree. However, whilst under observation she had another attack similar to those already noted and it was found that at this time the pyuria became conspicuous, notably, as the symptoms were disappearing. A cystoscopic examination was made. The bladder base was uniformly congested and small petechiæ were found scattered here and there. The left ureteral orifice was normal; the right was large. Its edges were everted and looked œdematous; there was no evidence of a tuberculosis. A catheter was carefully inserted into each ureter for a short distance and the urine collected from each side separately; that from the left was normal, from the right was opalescent, had a specific gravity of 1026, showed albumen, but no sugar or bile. Microscopically many old pus cells were found; no casts or red blood cells were present. The cultures from this side showed a pure strain of bacillus coli. The functional tests were good. The patient was treated with rest in bed for a month, was encouraged to lie on the left side, was kept on a low diet with forced liquids, purgation, and once a week a pelvic lavage was carried out with warm boracic solution and followed by silver nitrate instillation. She was discharged with no pyuria, sterile urine, and I believe she went to term and had normal delivery.

THE CHILD

A young girl of five and a half years was admitted complaining of fever.

Personal History. Was born of normal parents, and apart from obstinate constipation had never been ill until the onset of the present illness.

Present Illness. Began six months ago with all the signs and symptoms as what might be styled grippe. She was taken ill suddenly with a high fever, 104°–105°, chilly sensations, sweats, headache, vomiting, and considerable prostration. Her condition was somewhat alarming for several days and then slowly resolution took place and she was able to be about. Note the absence of pain, urinary distress or abdominal discomfort of any kind. The parents stated that she did not recover from this attack at all well and were convinced by the frequent attacks of fever which she had from time to time that she had tuberculosis and prevailed on their medical attendants to have her sent to the mountains. After a short sojourn there she was referred to us for examination.

She was found to have on admission a very slight pyuria and a marked leucocytosis but was otherwise normal. While under observation she developed an attack characterized by high fever, rapid pulse, chills, sweats and marked prostration. It was at this time that careful examination revealed slight tenderness in the right costa-vertebral angle, focusing attention on the possibility of the presence of this condition. The urine was scanty in amount and apart from a few pus cells, was quite normal. Towards the close of the attack, however, it became distinctly clouded and showed a heavy sediment of almost pure pus. Bacillus coli in pure culture was recovered from it. Tubercle bacilli were never found even though guinea pig inoculation was resorted to.

Cystoscopic examination here revealed very slight congestion of the trigone, some eversion of the right ureteral orifice and a normal left orifice. Catheters were gently inserted into each ureter for a short distance and the urine collected. That from the left side was perfectly normal; that from the right side was turbid and contained many pus cells. The pelvis of the right kidney was lavaged twice at intervals of a week. The symptoms subsided, the pyuria cleared up and to this day, almost a year, she has been very well.

Even though these cases are more or less typical in character it will be noticed throughout each history how varying and sometimes contradictory the symptoms may be. Attempts to classify or tabulate symptoms are as a rule futile; each case being a law unto itself and being judged accordingly.

In the acute cases it is usual to have them ushered in with all the signs and symptoms of an acute infection such as grippe or the exanthemata, that is headache, fever, chilly sensations, chills or sweats, vomiting and generalized abdominal pains, perhaps localized later to one or other side. These general symptoms may last from a few days to one or two weeks and then slowly disappear only to recur in a short time with renewed vigour. The temperature as a rule runs a course similar to acute pneumonia and may present a termination by crisis or at times by lysis. The chilly sensations may last from a few hours to a few days and are often quite severe and may be followed by sweats. Pain, we are told, is the biggest liar in the world, and in pyelitis it is no exception to the rule. It is frequently present in a generalized form and only in the later stages do we expect any localization. When present it does not radiate.

In the more or less chronic and milder types of the disease one may be easily misled by the absence of many or all of these symptoms and our attention may only be drawn to the true nature of the condition by the pyuria, which is demonstrable always at one time or other during the course of the disease.

Symptoms referable to the bladder are extremely variable and misleading. These may be towards the close of the acute attack or in the long standing or chronic cases a sense of fulness or ache in the region of the bladder and at times some disturbance of micturition such as frequency or burning during or after the flow. In the majority of cases they are of little moment; at the same time these symptoms may be confusing factors and have often led to the mistaken diagnosis of cystitis alone, with of course, unfortunate results.

Of all the symptoms those of fever and pyuria stand out preeminently as the most constant and suggestive of all. Heubler some years ago in the German *Archives of Internal Medicine* drew attention to the numerous cases in children of obscure fevers which could be traced to pyelitis. Repeated urine examination, therefore, is of utmost importance in obscure febrile conditions.

It is noteworthy that in several cases recently observed the urine from the bladder was comparatively free from pus during the height of the attack, and only with the subsidence of the fever did a heavy sediment of pus appear, suggesting the possibility of plugging of ureter with later evacuation, drainage, and disappearance of the symptoms. The chief problem we are presented with in the matter of treatment is largely one of drainage, with at the same time due consideration to the special ætiological factor in each individual case whether it be intestinal, pelvic, or blood infection.

There is no doubt that the best single agent at our command to secure drainage is the ureteral catheter. The introduction through the cystoscope of such a catheter into the ureter of the affected side being almost in every instance followed by markedly beneficial and far reaching results. During this procedure it has been customary not only to drain out the thickened or inspissated pus but the kidney pelvis has been lavaged with warm boracic, and when the return flow became clear, 5 to 10 c.c. of a 1 per cent. silver nitrate solution was instilled. This procedure is not associated with pain or distress if one refrains from over-distension of the pelvis, and it may be repeated each week. A cure is obtained only when the cultures of the kidney urine are sterile and the urine is free from pus.

At the same time we should not minimize the fact that many excellent results have resulted from the application of the postural treatment, rest in bed, forced fluids, purgations and the administration of urinary antiseptics such as urotropin. We are aware that the instruction of the patient to lie on the sound side as much as possible has alone given good results, and are forced to admit that in children we are largely dependent on this method of treatment because of the difficulty of frequent instrumentation. Many authorities advance modified treatments, but the one most commonly adhered to is that of alternately changing the reaction of urine by the adminstration for one week of sodium bicarbonate or potassium citrate 2–5 grains every five hours and the succeeding week to give acid sodium phosphate, in this manner creating an alternate alkaline and acid medium. Urotropin may be also given in as large doses as 75 grains in twenty-four hours. The use of vaccines and serums has been singularly disappointing.

Of all the types those associated with pregnancy are the most troublesome and often end most disastrously. It has been the custom of many because of the unsatisfactory result of treatment and the severity of the disease often in pregnancy to induce labour because this procedure produces early relief, no doubt by establishing free drainage. Surely then, by lavage or the other method of treatment we ought to be able to obviate this drastic step, pelvic irrigation especially having yielded excellent results. Many cures have been established during pregnancy, whereas other patients have been carried to term successfully and then a cure has been established.

There is undoubtedly a very small but distinct group in which all methods fail to meet the requirements of a cure. In these we often have to provide free drainage by the prolonged use of a catheter or by a nephrotomy.

In conclusion, I should like to express my thanks to Drs. W. W. Chipman and Oertel for their kind assistance in the preparation of this paper.

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The Sixth Annual Congress of the Canadian Public Health Association will be held in Ottawa on September 27th and 28th, 1917. The meeting of the Canadian Association for the Prevention of Tuberculosis will also be held in Ottawa on September 26th, 1917.

SUGGESTIONS FOR A FURTHER CLASSIFICATION OF CASES OF SO-CALLED SHELL SHOCK

By H. P. Wright, Captain, C.A.M.C.

THE importance of differentiating the cases now called shell shock will, I think, be appreciated by all those who have to do with the preparation of A.F.B. 179, the Medical Boards, and lastly, that important board which it should be the ambition and duty of all medical officers to counsel wisely and honestly,—it is almost unnecessary for me to say that I refer to the Pensions Board. This is the *prima facie* final board to which all Medical Boards may lead, and on the work of which depends the Government's final responsibility to its soldiers, so that deserving cases may be justly rewarded, and undeserving and malingering ones treated with the scant courtesy that they deserve.

I do not for a moment think that it is possible to draw any hard and fast rules, tabulating the different kinds of so-called shell shock, but I am quite convinced that it is only by a careful consideration of each case that justice may be meted out, and the object of this paper is, to turn the compass of more competent and able brains in this most important direction.

Shell shock has been defined as the symptoms produced by exposure to the forces generated by the explosion of high explosives without visible injury. This is the only definition that I have ever heard given to shell shock, and while I have no quarrel with it as far as it goes, my only concern is that it does not go far enough. Before leaving the definition I would like to express a doubt as to the advisability of the nomenclature. The name itself is often enough to retard the recovery of these very sensitive and susceptible patients—but, I suppose, the love of the medical profession for a loose term such as influenza, myalgia, or shell shock is unweanable.

In South Africa when a man was "fed-up" to the bursting point he had "Manseritis"; in this war he often falls back on "shell shock".

Read before a meeting of the Medical Society of the Granville Canadian Special Hospital, Ramsgate, Kent, and before the Canadian Medical Association, June, 1917.

From my observation of cases at the Granville I would like to submit the following classification of shell shock.

1. Shell Concussion.
2. Shell Hysteria.
3. Shell Neurasthenia.
4. Malingering.

Shell Concussion. A condition of unconsciousness caused directly by the physical forces generated by high explosives, and in the large majority of cases followed by a traumatic neurosis.

In this class, the man is most frequently knocked unconscious and either is buried and suffers an injury to his head or is blown up and lands on his head. A man injured in this way *does not remember hearing the shell coming and has complete loss of memory from the time just previous to the explosion, to a period varying from half an hour to hours after the explosion.*

The general symptoms of this class are: headache, dizziness, loss of memory, shaking, and very often by the time they reach this hospital a traumatic neurosis has developed. Two most important points are that they do not hear the shell coming, and that they do suffer from loss of memory. In regard to the first, it would seem that certain types of shell can be heard while others cannot, and the only explanation is, that as a result of the concussion their loss of memory is "antedated".

Of course, the second point has to be brought out by careful questioning, and even then one cannot tell what the patient's memory was like before the injury.

In this class it is not difficult to accept the pathogenesis of shell shock as described by different observers, e.g., increased pressure of spinal fluid, and the presence in it of albumen, blood, etc., for the first forty-eight hours. These cases usually recover, of the others that die, we do not know. I suggest that this is the only class of shell shock that die from the original trouble.

In ordinary simple concussion of civil life the syndrome of sequelæ that is most feared is traumatic neurosis. If this is so often a complication in uneventful peace times, how much more likely it is to develop after a concussion resulting from a terrifying cause and in a bloody and fearful environment.

In a consideration of the three last groups—Shell Hysteria, Shell Neurasthenia, and Malingering, I fully appreciate the great difficulty of separating them from one another, and realize that in both hysteria and neurasthenia there may be an element of malingering, and that the term psychogenetic, which is employed by Major Russel, satisfies all these demands. Still, psychogenetic, to my mind, implies a generic term. Could not any mental case not of an organic nature be classed as psychogenetic? Therefore it is my endeavour to classify further these psychogenetic cases.

The mental picture of traumatic neurosis, shell hysteria and shell neurasthenia, is very similar. Certainly by the time they arrive at this hospital they have much in common. Without attempting to discuss this from a psychological or metaphysical point of view, I cannot refrain from recalling the old and familiar simile which compares a piano to the brain and the "ego" or "will" to the man who plays the piano. The piano is no good without the man and the man cannot make music without the piano. In these psychogenetics, the "will" seems to have lost control of the brain. The brain is good enough but the will is at fault: or to express it in another way, the subconscious self has got the better of the conscious self; or again, the higher centres have lost control of the lower centres. Be that as it may, the fact remains that the primary cause of the trouble is psychic. How this disturbed psychism manifests itself is of little importance. That is, whether the man is blind, or dumb, or has a functional paralysis, the mental pathology is the same. In other words, a discord has resulted and the patient should be taught to functionate without discords. To treat the blindness or paralysis as though it were the disease is almost parallel to treating the secondary rash of lues locally and leaving the *Treponema pallidum* to roam about at will in the body. Just as one is sure to get rid of the rash, so, one with faith and enthusiasm will overcome the blindness or paralysis, but, *the original disease remains*. If, on the other hand, the disease is treated, the symptoms will disappear quickly enough. The only way to treat the disease is to help the patient to regain control of his mind. In certain cases, e.g., deaf and dumb men, I have resorted to hypnosis, recognizing that I was treating a symptom, and later, I have endeavoured to treat the disease. Just one more point before leaving this interesting and elusive subject. I suppose I am safe in saying that in sleep the will or higher centres are in abeyance—still we dream—and what a dream is I dare not discuss—and who has not awakened from a dream with a very vivid remembrance of some so-thought physical suffering undergone in the dream. May not the pains and aches of neurasthenia and hysteria be compared to the sufferings of the dreamer?

Shell Hysteria. A condition of superemotionalism, in which one or more of the senses is hyperbolic and exaggerated, without any known organic cause.

The largest percentage of shell shock cases sent to this hospital have an hysterical basis; there are several potential factors of interest.

1. Hereditary mental instability.
2. Acquired mental instability, such as nervous diseases the patient may have had in childhood or youth, e.g., convulsions, chorea, "fits", etc.
3. Age.
4. Alcoholism.

Age. The selected sex of ordinary hysteria must, even by suffragettes, be acknowledged to be their sex, and, I suppose, the favourite periods placed at the genesis and exodus of their womanhood. While I will not say that the cases of shell hysteria are of a lady-like disposition, I have been impressed by the fact that they are universally under thirty years of age, and very often in the teens or early twenties.

Alcohol. The habit of issuing rum to men just before an attack, while it undoubtedly gives them a devil-may-care and pugnacious feeling, also in its after depressing effects renders the nervous mechanism more susceptible to any shock. If alcohol acts by depressing the higher centres (and it is interesting to remember that the effect of alcohol lasts for twenty-four hours) may not alcohol plough the field of the brain and so prepare it for the psychic seed of shell hysteria?

A discussion of the pathology of hysteria is, of course, far beyond me, but it seems to be an affection of the senses with a correspondingly disorganized perspective. Gaskill and his school have definitely proved that the sympathetic nervous system is an outgrowth of the central nervous system. What control the central nervous system exerts over the sympathetic system I am not prepared to say, but certainly in shell hysteria there are certain manifestations which imply a disturbance of the sympathetic nervous system.

History. The first point to note is, how long the man was in France and under what conditions. This is most important, as *shell hysteria very seldom occurs in a veteran of some months standing.* The personal and family history are important for the investigation of any mental or acquired instability and alcoholism. Under present illness, usually, there is *a history of having heard the shell* *coming and of a subsequent semi-conscious condition.* Whether or not they do actually hear the shell is impossible to say. If they do not, I think that very often on account of their hypersensibility they imagine that they have heard it, and it is interesting to note that the history invariably bears out this statement. The symptoms that subsequently occur may vary enormously depending on the strongest psychic impressions just previous to being buried or being blown up.

Again other hysterical stigmata may result from suggestions made by an orderly, nursing sister, or medical officer in a C.C.S. or other hospital. The patient's mind is in so receptive a state, and as a result of his experience, he is only too glad to welcome any symptom which may manifest itself in such a way that he may become unfit for further active service abroad. There is no better illustration of this point than the fact, that patients with an objective wound seldom or never develop shell hysteria. It is in this class of self-inoculated cases that one is almost forced to conclude that there may be an element of malingering—certainly it is easy to understand the motive.

Physical Findings. There are only two or three points that I know of that are of any interest in the physical examination. Patient usually fairly well nourished. Tremor of the tongue and hand. Pulse rate slightly increased and quite noticeably so on exertion or excitement. Usually profuse sweating under the armpits. Marked dermatography, usually of a dilatory type. Blood pressure, systolic from 130–145, diastolic 90–100. Knee jerks noticeably increased. No pathological reflex, but often a pseudo ankle clonus.

In fact, many of these cases, by their physical findings, could be easily confused with hyperthyroidism; and my own theory is that when the brain is lost control of by the "will" it, in turn, disturbs the sympathetic nervous system and so one sees the above picture.

To recapitulate, the important points to notice in shell hysteria are:

1. History of hearing shell coming.
2. History of inherent or acquired mental instability.
3. Alcohol.
4. Age, and length of time in France.
5. Physical findings, pulse, sweats, and so on.

Shell Neurasthenia. A condition of bodily and psychic asthenia occurring as a result of the exigencies of active service.

A consideration of the possible ætiological factor of shell neurasthenia must of necessity be very similar to shell hysteria, and it is unnecessary to rediscuss hereditary and acquired mental instabilities and alcoholism.

Age. The majority of cases are amongst the *older men as opposed to the hysterias,* which so frequently occur in youths. The reason of this may be that, as a rule, the older man has himself under better control, and so manages to escape shell hysteria. However, after months, the struggle is too much for him and he succumbs to nervous and bodily exhaustion, and the result is the typical neurasthenic. Neurasthenia, in a man who has put up a good fight for some months under trying circumstances, is an unreasonable disease with a reasonable cause—and I would go further, and say that shell neurasthenia would almost certainly result in any one of us if we "stood the gaff" long enough. It is only by the judicious withdrawal of battalions, etc., from the front line to billets, where they may rest and recuperate, that the British Army is saved from being an army of neurasthenics. Naturally enough, too, with men as different from one another as trees, some bow before the storm at an earlier phase than others—and the first to go are the ones that have some inherent or acquired mental instability. I do believe that the neurasthenic puts up a fight. The hysteric approaches the ordeal in much the same spirit as the putting up of hands and "Kamerad" of the German prisoner. At the first opportunity, they both willingly surrender.

Syphilis. In its tertiary state this is a disease primarily of the nervous system and Russel's exhaustive theory, which so satisfactorily explains the order of the occurrence of the symptoms and signs of syphilis of the nervous system, is very helpful here. In tertiary syphilis that part of the nervous system which is exercised most, first shows fatigue and eventually paralysis. Neurasthenia is exhaustion, and I suppose no two things age a man more quickly than alcohol and syphilis.

The symptoms of shell neurasthenia are variable. However, nearly all complain of headaches, dizziness, insomnia, anorexia, and usually visceral or spinal pain. In fact they are ordinary neurasthenics with an easily explainable cause.

I imagine that the cases of shell shock resembling Addison's disease, which have been recorded by Crile, are the truest examples of shell neurasthenia. However, by the time they arrive at this hospital the more striking signs have disappeared. The asthenia is on the high road to recovery and the only manifestations of neurasthenia that remain are the mental ones—and these, I expect, will remain either till they are treated psycho-therapeutically, or the cause of the disease is removed, i.e., the war ends.

Malingering. It is not my purpose to consider the ways and means for its detection, and I have only included it in the possible category of shell shock because no classification would be complete without its enrolment. To endeavour to detect the malingerer is not at all a palatable task, but, in the interests of the country, it must be done. Genius has been defined as the capacity for taking pains, and infinite patience and a suspicious mind usually discover the imperfect detail of the symptoms or signs of the malingerer.

Modified forms of malingering, such as hystero or neuro-"malingeritis", are of a different nature. The shell hysteric or neurasthenic may develop into a malingerer, and the cause is not hidden or difficult to find. It is assuredly difficult to supply an impulse greater than that of self preservation. The shell neurasthenic or hysteric frequently does not recover as quickly as he would if the war was over and the state of civilization not sufficiently advanced to set up the Pension Boards.

PROFESSOR FRASER HARRIS represented Dalhousie University Medical Faculty at the recent meeting of the Medical Council of Canada, which took place in Ottawa on June 12th. Some quite important business was transacted and arrangements made for future work. The examiners for October, 1917, and June, 1918, were appointed.

It is greatly to be regretted that neither of the gentlemen who had been elected by the Medical Board of Nova Scotia to represent that province, was present. Much of the work of the Federal Council can proceed efficiently only when all the provinces are represented by their only accredited representatives. To have a province completely unrepresented is not contemplated in the Act constituting the Council.

FRAGILITAS OSSIUM, WITH REPORT OF A CASE

By Alton Goldbloom, B.A., M.D.

Montreal

FRAGILITY of the bone has long been known to be associated with certain chronic diseases, notably phosphorus poisoning, congenital lues, tabes, malignant disease, and senility. In all these the underlying cause is usually quite evident or can be found by the usual diagnostic methods. Lobstein, in 1833, was first to call attention to a peculiar disease entity characterized by an idiopathic, usually hereditary, predisposition to fractures from very slight violence. Such a case came under our observation during the past winter at the Royal Victoria Hospital in the service of Dr. Archibald.

The patient was a farmer aged thirty-three, and was admitted to the surgical wards of the Royal Victoria Hospital on February 21st, 1917.

Present Illness. Two days before admission the patient was kicked by a cow over his left patella. He fell to his right side and was unable to raise himself from the ground. His doctor told him that both legs together with his left knee cap were broken.

Past History. The patient has been subject to fractures ever since he was fifteen months old, the present accident making his forty-ninth fracture. The first occurred at the age of fifteen months while he was learning to walk. His father told him that he merely leaned against a door when his left leg gave way under him. Other fractures followed in rapid succession involving the left forearm once, the left femur twice, the right tibia and fibula about ten times, while the remaining thirty-five involved the left tibia and fibula usually at a point about three inches above the ankle joint.

Five years ago he fell on his knees and fractured the left patella transversely. This was sutured at the Royal Victoria Hospital

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by Dr. Garrow. Since then he was free from fractures until his accident of two days before his present admission.

Forty of these fractures or 83 per cent. occurred before he was fifteen years of age. They were frequently spontaneous or at most occurred after some very slight cause such as a sudden turning on his heel or a slight jar. Repair was always very rapid.

At the age of six he developed a marked scoliosis with the main convexity to the right involving the dorsal vertebræ from the fifth to the twelfth. At the age of seven a right genu recurvatum developed for which an osteotomy was performed at Montpelier, Vermont. Apart from his fractures his previous health has been excellent.

His family history was quite negative, there being nothing in it to suggest hereditary predisposition, as is nearly always the case in this disease.

Physical examination shows a fairly well developed and nourished young man of somewhat flabby musculature. Apart from his osseous system, the general examination is quite negative save for one very interesting point, namely, the colour of his sclerotics which are of a china blue. This feature, we subsequently learned, is pathognomonic of the disease we are discussing; a point which we shall refer to later on.

His skull is slightly bossed, prominent ridges can be felt all along the suture lines, otherwise it is normal. There is a marked right-sided scoliosis and along the costo-chondral junctions can be felt what is evidently the remains of a rachitic rosary. All the long bones present apparently normal epiphyses and rather thin shafts. This could be very easily made out upon examination and it is very beautifully illustrated in the radiograms. (See figure). This anomaly doubtless explains why it is that in this disease the fractures are nearly always in the shafts and rarely in the epiphyses. The right tibia is very irregular in outline just above the ankle, the result of numerous badly united fractures; while the right leg presents a moderate genu recurvatum. At the present admission the fractures involved both tibiæ and the left patella. That of the left tibia is a green stick fracture just below the upper epiphysis, while that of the right is oblique through the upper epiphysis on the inner side and evidently intra articular.

On February 23rd, 1917, operation was performed by Dr. Archibald for suture of the patella, when the very unusual combination of transverse fracture of the patella together with avulsion of a splinter of the tubercle of the tibia was found. These were repaired in the usual manner and both legs were put up in plaster.

Diagnosis: Fragilitas ossium.

REMARKS. The disease is a very rare one. It is known variously under the names of Fragilitas ossium, Osteogenesis imperfecta, and Osteopsathyrosis idiopathica. This is the only such case in the records of the Royal Victoria Hospital. Bamberg and Huldschinsky have only been able to find one hundred and five cases in all the literature up to 1913. It is characterized by an extreme predisposition to spontaneous fracture, usually hereditary and usually showing itself quite early in life. It is twice as common in males as in females. Bowing of those bones which are subjected to weight bearing is a very common associated condition. The rœntgenograms of the long bones show a clearly defined medullary canal with a sharply outlined thin cortex in the shaft, while the epiphyseal ends are almost without medullary outline. The thinness of the shafts compared with the size of the epiphyses is a characteristic feature. As exemplified in this case the predisposition to fractures tends to disappear when adult life is reached.

The sclerotics are always of a china blue colour. It is interesting to note that where the hereditary predisposition to fractures has been present it showed itself only in those members of the family who had blue sclerotics: those who had white scleræ did not have fractures and moreover bred true, that is to say, none of their progency had blue scleræ or showed this diathesis: while those who had blue sclerotics not only were liable to fractures, but also transmitted this trait. In no case has the condition been known to skip a generation. Burrows has reported such a family in which he has traced the blue sclerotics through four generations. There were twenty-nine individuals in all: thirteen had blue sclerotics and of these nine had brittle bones. Among the remaining fourteen members who had white sclerotics not one was known to sustain a fracture.

Conlon has reported five generations of blue sclerotics in a family. In his series 84 per cent. in all of the offspring showed the anomaly. Stephenson's family was traced through four generations and Harmon's through five. Numerous detailed pedigrees may be found in the literature, in the main they all agree with Burrows' observations.

The condition of the scleræ was first called attention to by Eddowes in 1900 and the connexion with brittle bones emphasized. It is said to be "due to a deficiency of fibrous tissue in the sclerotic coat, whose thinness and translucency allows the underlying choroidal pigment to be seen". This point can be understood when we consider that bone and connective tissue are both of mesoblastic origin. We have already noted the flabby, atonic musculature in our patient. In other cases this has been described as definitely atrophic (e.g. Bookman's case). If we add to this the fact that besides the calcium deficiency in the bones the stroma (which of course is composed of connective tissue elements) is largely deformed, it is probable that we are dealing with an embryonic defect involving all mesoblastic structures and not with a disease of bone *per se.*

The pathology of the disease is not thoroughly understood. There is evidently an inability on the part of the tissues to form normal bone. Not only is the calcium diverted to other uses, but the histological structure of the bone is altered, the laminæ being either imperfectly formed or entirely wanting.

McCrudden, Bookman, and others have studied the metabolism in these cases and have found a definite disturbance in the calcium equilibrium. In Bookman's case the calcium retention was only 11·7 per cent. of the calcium intake. After the addition of calcium lactate to the food the retention was raised to 42 per cent. of the intake. He also found that the calcium retention was favourably influenced by phosphorus and cod liver oil just as it is in rickets. Bamberg's case had no fractures during one year's treatment with the latter.

The treatment is of necessity very difficult. Metabolism experiments would seem to indicate the use of calcium salts or phosphorus and cod liver oil, but these cases are so rare that statistics of any value are so far unavailable. Plisson (quoted in Speed's book on "Fractures and Dislocations") has reported a case in which there were eighteen spontaneous fractures in nineteen years; the patient was put under treatment by adrenalin after which no more fractures occurred. Yet as our own and other cases have shown that the tendency to fractures diminishes with the approach of adult life, it is very likely that the adrenalin was given at an opportune time leading to a confusion between post and propter. Strontium and pituitrin are among many drugs that have been tried without any great benefit. Although in such cases all methods of treatment suggested deserve a thorough trial, we must of necessity devote our main attention to prophylaxis against any slight traumata which might result in fractures. When fractures do occur the greatest possible care must be taken to keep the fragments in good position. Healing, as we have said, is rapid, and before puberty is accompanied by abundant callus formation. Our aim must be to avoid deformity. We have seen that the intervals between fractures become gradually longer so that by the time adult life is reached a patient may with proper care have a serviceable pair of legs. No such care had been taken with our own case with the result that he came to us with his leg so deformed that he was unable to get about save on crutches and then not without considerable difficulty. A little care in his early days would have made him a great deal more useful to himself and others than he is at present.

In conclusion, I wish to express my indebtedness to Dr. Archibald for the privilege of presenting this rare and most interesting case.

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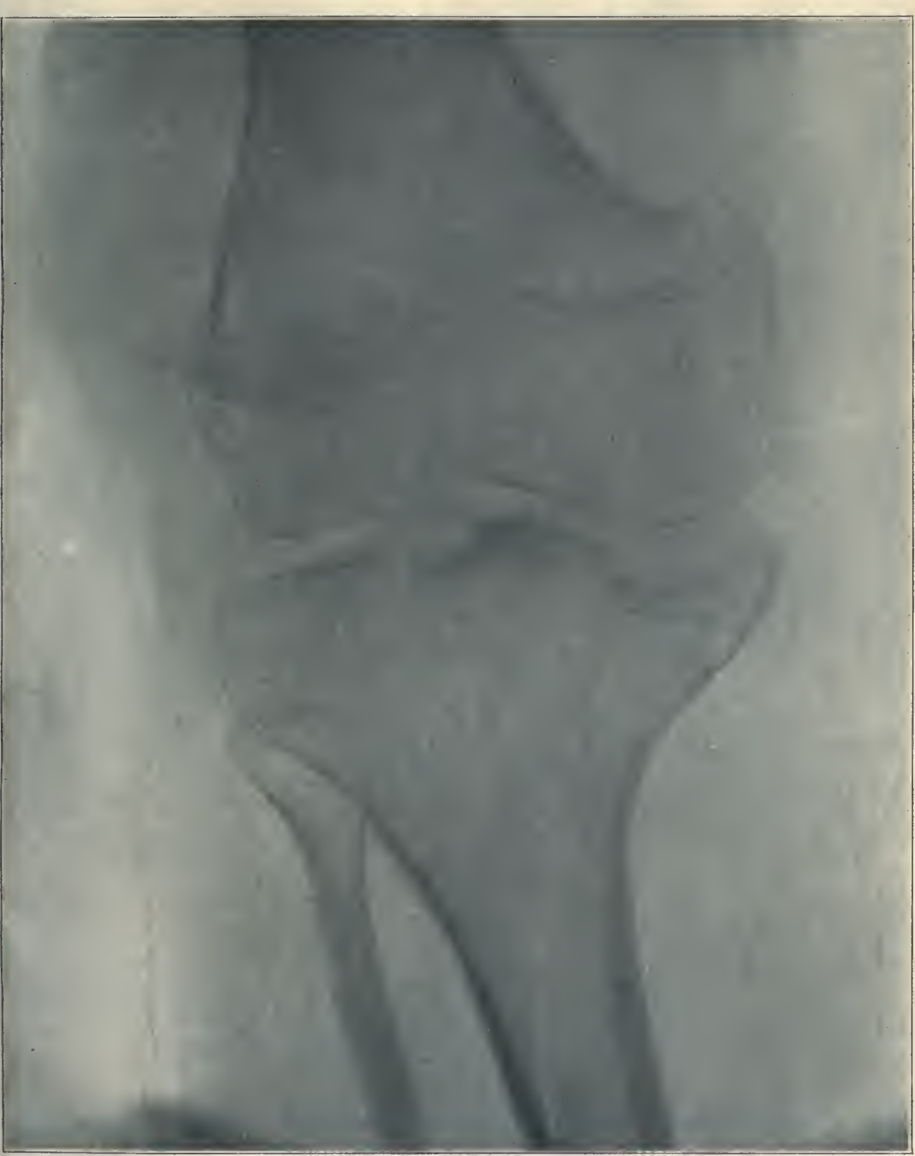
A DEPUTATION from the Association for the Care of the Feeble-minded of Toronto recently waited upon the Separate School Board with a request that the Board should lend its coöperation in an effort to separate the feeble-minded children from others and place them in cottages on the municipal farms near Thornhill. It was stated by Dr. Hincks that during the past three years one thousand cases sent from the Juvenile Court had been examined at the General Hospital and that of these 676 were mentally deficient; 285 were inveterate thieves, 59 had been guilty of starting fires, 120 had committed acts of grave bodily injury, and 59 were guilty of sexual immorality.

640



Case of fragilitas ossium showing green stick fracture of the tibia. Note particularly the size of the shafts compared with the epiphyses, the sharply outlined cortex in the shafts, and the almost complete absence of cortical outline in the epiphyseal ends. Note also the extremely thin shadow thrown by the bone.

Case Reports

TRAUMATIC EXTRA-PERITONEAL RUPTURE OF THE BLADDER WITH FRACTURE OF THE PELVIS

By Max O. Klotz, M.B.

Ottawa

THE comparative rarity of the accident, judging at least from the number of cases reported in the literature, is sufficient reason for a report of the following case.

Quain, in *Surgery, Gynecology and Obstetrics* of July, 1916, reviewing the literature, reported only one hundred and twenty-seven cases, covering almost one hundred years, of whom about one third were from the United States and the remainder from abroad. Hawkes reported a further case in the *Annals of Surgery,* February, 1917, with recovery. The mortality, on the whole, has been high, Quain stating the total mortality to be 74 per cent. and of eighty-three cases reported before 1890 the mortality was 86·7 per cent. In forty-four cases published subsequent to that year the mortality was 48 per cent. The records since 1905 show further improvement, in so far as the mortality has been reduced to 38 per cent.

A probable reason for the high early mortality lay, partly, in the imperfection of the technique, but more probably in delayed operative interference, as a result of which septic infections were sure to be followed by a very high death rate.

In considering the diagnosis of a probable rupture two or three points only will be borne in mind.

First. The location and the character of the injury. The patient's symptoms invariably point to serious lesions in the pelvic frame about the pubic arch and the history itself will give definite information as to the source and type of the factors producing the injury.

Second. Inability to void urine and possibly the appearance of a few drops of blood at the meatus. Catheterizing may not be

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followed by the withdrawal of any urine whatsoever, or may permit of the drainage of a small quantity of blood only, or a mixture of blood and urine.

Third. Palpation of the suprapubic region is not alone painful, but fails to reveal the presence of a normally distended bladder, and percussion may also fail to give any characteristic dull note, indicating the presence of a normally distended bladder.

Both palpation and percussion, however, are not always dependable, as a case seen some hours after the accident may give both a dull note and show the existence of a mass in the region of the bladder, which may be due to the extravasation of a large amount of both blood and urine into the prevesical tissues. There is not necessarily very much shock; certainly nothing like the amount one would find in the case of a intra-peritoneal rupture. On the other hand, although there is always great pain, definitely localized to the region of the bladder, and fruitless efforts at voiding, rectal examination as a rule gives us no great assistance at arriving at a diagnosis beyond confirming the seat of the pain, which is limited to the bladder and its immediately surrounding tissues.

Fracture of the pelvis, more particularly of the rami of the pubic arch, is almost always present, but crepitus is not always to be definitely felt; certainly not without an anæsthetic, the splinting action of the mucles often fixing the fragments and preventing definite movement. An x-ray examination should always be made at once, when at all possible. In the absence of facilities for doing so, no time should be lost in proceeding at once with operative measures, in the first place to drain the peri-vesical tissues and in the second place if possible, to close the rent in the bladder wall. The latter procedure is frequently associated with great difficulties and may be quite impossible, particularly if the rupture is deep-seated, lying almost behind the lower border of the pubic arch and involving the bladder wall at a point close to the sphincter. In these cases little remains to be done but to follow the usual routine of careful drainage and irrigation, when the wound will close spontaneously, generally in about six weeks' time, depending upon the size of the original opening.

The history of the case is as follows.—W. C., aged twenty years, strong, healthy, young man, driving for a local dairy. While delivering milk early the morning of February 21st, 1914, the sleigh on which he was driving was struck by a street car, the approach of which he had failed to note. He was thrown on the tracks in front of the car, falling under the fender and immediately in front of the wheels, which were locked by the brake but were skidding on the snowy rails. Except for the fact that the road was particularly smooth with frozen snow and ice, he would probably have been crushed to death. As it was, he was pushed ahead of the car for a distance of some forty feet, the pelvis being the point on which most pressure was exerted.

Examining him on his arrival at the hospital, I found his general condition good, but he complained of great pain in the bladder. He had been unable to stand without assistance, although he had tried to do so but found himself unable to carry his weight owing to pain in the pubic region. Examination revealed a few drops of blood exuding from the meatus, and the passage of a catheter was followed by the withdrawal of less than half an ounce of blood and urine. Distinct crepitus was not felt, but palpation of the left upper pubic ramus, within about two inches of the symphysis was so acutely painful that a diagnosis of fracture was made, which was confirmed by *x*-ray photograph, which was immediately taken. A diagnosis of rupture of the bladder being practically established, he was immediately transferred to the operating room and the prevesical space opened by a median incision. The subcutaneous tissues were intensely infiltrated with blood and the reflexion of the peritoneum itself upon the bladder more or less œdematous, showing evidence of extensive contusion. The bladder lay deep in the wound, was collapsed and on examination found to have a ragged tear of about an inch and a half in extent on its anterior wall, immediately above the sphincter, and projecting into the wound in the bladder was the outer fragment of the left ramus, which had been displaced downwards and backwards, the end of which terminated in a long spicule. The fracture was fairly readily reduced and remained in position without any further dressing than the application of extensive adhesive strapping around the pelvis.

It was found quite impossible to suture the rent in the bladder, so that after thoroughly evacuating all blood clots and irrigating with a saturated boric acid solution, nothing further was done but the placing of a drainage tube down to the opening in the bladder wall. At the same time a permanent catheter was inserted through the urethra and irrigations carried on at first every six hours, which were shortly reduced to twice daily. He had absolutely no bad symptoms until March 12th, when it was found that a small pocket of pus had collected in the most dependent portion of the space of Retzius, and this was drained by a tube carried to the site of the infection by the ischiorectal route. From that time he had no further difficulty and the whole wound was completely closed up on April 25th.

Unfortunately, about ten days before the wound finally closed he showed symptoms of typhoid, which were confirmed by blood tests, and he had the misfortune to spend another two months in the hospital before he was quite recovered from a severe typhoid infection. As it happened at that time, there was still considerable typhoid in the city, and certainly a very large number of carriers, following the very severe epidemic which had afflicted Ottawa during the immediately preceding years.

When he finally was released from the hospital he had not the slightest difficulty in walking, running or jumping and had as perfect control over his bladder as ever. As a matter of fact, he felt not the slightest inconvenience from his very serious accident.

THE following is the list of candidates who were successful in passing the examinations of the Council of the College of Physicians and Surgeons of Ontario: Howard R. Adams, of Freeman; Norman E. Betzner, of Moose Jaw, Saskatchewan; York Blayney, of Toronto; Arthur J. Boyce, of Goderich; Ernest A. Broughton, of Whitby; William E. Brown, of Gananoque; Frederick J. H. Campbell, of London; Thomas F. Carter, of Kingston; Thomas C. Clark, of Dundas; Robert D. Collier, of Picton; Isaac Cohen, of Sault Ste. Marie; Wilmer L. Denny, of London; John F. Doyle, of Kingston; W. H. E. V. Duffett, of Adolphustown; D. D. Ferguson, of St. Thomas; H. O. Foucar, of London; N. W. Furey, of Toronto; G. D. Gordon, of Kingston; Malcolm G. Graham, of Rodney; W. L. Graydon, of Toronto; Arnold Grisdale, of Niagara Falls; J. H. Howell, of Welland; L. M. Jones, of Chesley; J. A. Key, of Shanty Bay; G. F. Laughlen, of Point Anne; Patrick Leacy, of Lanark; F. W. Leech, of Newborough; A. E. McKenzie, of Toronto; J. W. McKenzie, of Toronto; G. W. MacNeill, of Owen Sound; T. N. Marcellus, of Finch; W. M. Martyn, of North Bay; W. T. B. Mitchell, of Watford; C. J. A. McKillop, of St. Thomas; W. C. O'Donoghue, of Smith's Falls; A. Phelphs, of Windsor; H. A. Rawlings, of Toronto; J. W. Reddick, of Toronto; J. A. Renwick, of London; P. R. Shannon, of St. Thomas; F. R. Smith, of Barrie; D. J. Taitt, of Brooklyn, New York; C. A. Wells, of Toronto; J. McS. Young, of London; R. S. Murray, of Galt.

Editorial

THE PRESIDENT'S ADDRESS

THE Committee of Arrangements of the Montreal Meeting made a change this year in the usual programme by having the President's Address delivered after the Annual Dinner of the Association. Messages of congratulation were read from members of the Association who are overseas, including one from Colonel Murray McLaren, C.M.G., the past president. A cablegram from Colonel H. S. Birkett, C.B., Officer Commanding No. 3 Canadian General Hospital (McGill) in France, and Dean of the Medical Faculty of McGill University, unfortunately did not arrive until the following day and therefore could not be delivered to the members at at the same time as the other messages. It read: "All members of the Association in the unit under my command join me in best wishes for success of meeting."

In his address, which we publish in full in this issue of the JOURNAL, the President drew attention to the fact that the present year is the fiftieth since the inception of the Association, and quoted the objects which those who were instrumental in founding it hoped to accomplish by a Dominion-wide society. In how far these objects have been attained and where failure has resulted, he recounted, and then proceeded to outline in a broad way the problems which the medical fraternity will be called upon to solve in the near future, including that of national insurance against sickness and accident. The President urged upon the members the necessity of being prepared for this and, rather than have such matters forced upon the notice of the profession by legislative enactment, suggested the appointment of committees whose duty it would be to study the problems presented, and who would, therefore, be in a position to coöperate with the Government when the time came.

If our Association is ever to take the place which its founders hoped and worked for, and become the recognized authority in all matters pertaining to its special sphere, it will only be by giving more prominence to this feature in our annual gatherings, for the care of the public welfare is the only point at which we as an association touch the general public as a whole. The President's suggestion should be thoughtfully considered by every member of the Association. It will be the duty of a future meeting to decide what is the best means of carrying it out. Living as we do in a country of such great distances that it is only possible to have a representative gathering of our members brought together for a few days annually, and the appointment of committees to study the problems during the intervals between the meetings would probably have little result owing to the difficulty of getting such committees together. We have, however, in the Executive Council which consists of the office bearers of the Association and fifteen members elected annually by ballot, a body which should be representative of the whole Dominion. But under the present by-law the Council must be chosen from those members who have registered as present at the meeting, and the election takes place at the first general session, that is, at the opening meeting of the year. As a result, in the recent Montreal meeting only one third of the total number enrolled as present at the meeting were eligible as members of the incoming Council when the choice was made on the first day. Postponing the election of the Council until a later date would overcome this difficulty, and in appointing sub-committees for drafting reports on subjects of public welfare, the Council might be given power to add additional members, who have special qualifications to act on such committees. The alternative plan of having committees appointed at each meeting to bring in reports during the meeting would mean failure from want of time and the press of other business.

The Canadian Medical Association can never become a real power in the country like the American association until it is able and ready to speak authoritatively for the whole of Canada upon all subjects relating to public welfare. We strongly urge upon the President and his Executive Council the formulation of a plan for presentation at the next annual meeting whereby the policy which he so ably advocates may become one of the principal features of every meeting.

THE ADDRESS IN MEDICINE

THE delivery of the Address in Medicine (published in this issue) by Dr. Theodore C. Janeway, of Baltimore, was an event of importance in the annals of the Association. Speaking out of a wide experience, with scholarly incisiveness, and from the point of view of the modern consultant, upon some of the finer distinctions of medical science, Dr. Janeway touched the higher ideals and aspirations of the profession, and elicited a glow of enthusiasm and the deep attention of his crowded audience.

Taken as a whole, the Address may be described as a thoughtful and original pronouncement upon the province of that ideal physician who, whether he occupy the place of renowned consultant, or obscure practitioner, has it as his duty and function to gather the threads of information yielded by subjective and objective facts, and to weave therefrom a judgement for the best welfare of the individual or the community. To those familiar with the writings of Osler, its words struck home as the verification and logical conclusion of those immortal principles laid down for younger aspirants in such addresses as "Internal medicine as a Vocation", which are here formulated with new freshness for a later generation. But, in the vast extension of our knowledge to-day, and in the added complexity of our problems from the introduction of innumerable new methods of investigation, in the shifting of the modern standpoint from that of therapeusis to prevention of disease, and the substitution of the ideals of the New Physiology, the initial task of the physician remains the same, the personal observation and experience of the master mind stands not less but more than formerly as the one thing supremely essential, relegating "Department store medicine" to a proper subordination, and claiming, by a selective choice, the service of the infinitely wider range of methods and resources that the present holds. The standard of medical opinion is to be recognized as that not of abstract truth, but of fidelity to fact and of loyalty to the best interests of the patient, and the relativity of the concept normal to the age, sex, environment, and other correlated facts in the life of every individual, with the varying importance of slight deviations from the normal under slightly varying circumstances, must be established. The fruits of a wide personal experience were embodied in these and many other clear cut definitions and wise generalizations which imparted their own direct stimulus.

Dr. Janeway closed a truly inspiring address by a reference to America's adoption of the cause of the Allies, that touched a vibrating chord, as shown in the tenser silence that greeted it, and the insistent applause that followed: "You of the Canadian profession have borne the burden and heat of the day, with a nobility to which no words of mine can pay a fitting tribute. Accept my inarticulate homage. May *we* not fail to meet the test, and, shoulder to shoulder with you, ensure that victory of justice and mercy which alone can bring an enduring peace!"

A CANADIAN CAVENDISH LECTURER

IN extending to Captain Macphail an invitation to deliver the Cavendish Lecture, the West London Medico-Chirurgical Society has bestowed a high compliment upon one who is well known as a man of letters both in England and in Canada. It is an honour that has seldom fallen to the lot of a Canadian, Sir William Osler being the only medical man belonging to this country who had previously received the distinction.

To readers of this JOURNAL no comment need be made upon the literary ability of Captain Macphail. It would seem, however, a fitting occasion to express the keen sense of loss, occasioned by Captain Macphail's absence on active service, felt by those who are endeavouring to carry on the Journal without the assistance of the experience and wise judgement of its editor.

Selecting as the title of his lecture the simple phrase "A Day's Work", Captain Macphail gave a faithful and vivid description of the taking of Vimy Ridge, a day's work that Canadians will ever remember with pride. Particular reference was made to the part taken by the medical services, whose efficient and well-directed efforts made it possible to clear the field of wounded within the short space of three hours. Captain Macphail closed his address with a stirring plea for the continuance of the old British traditions as contrasted with the scientific relentlessness of the enemy, and a solemn warning against invidious efforts of theorists to change the internal polity of Britain.

SIR WILLIAM C. MACDONALD

IN the death of Sir William Macdonald, which occurred at Montreal on Saturday, June 9th, 1917, McGill University has lost its Chancellor and a most generous benefactor and friend. A familiar figure has gone from the prescints of the University and an influence that was constantly working for the progress and welfare of every department has been taken away. The magnificent buildings which owe their existence to one whose pleasure it was to wander amongst them, remain, however, as a lasting memorial to his generosity and a tangible sign of his interest in the cause of education. Quiet and unassuming in manner, even austere in his mode of living, Sir William will be remembered as one of the greatest patrons of education in Canada. A direct descendant of the chieftains of a gallant clan that formed part of the small, devoted band that made a last stand by the shores of dark Loch Shiell in defence of Bonnie Prince

Charlie, William Christopher Macdonald was born in Prince Edward Island at Glenaladale, in the year 1831. He was the youngest son of the late Hon. Donald Macdonald, at one time president of the Legislative Council of Prince Edward Island, and grandson of the eighth Chief of the Clan Macdonald of Glenaladale in the Highlands of Scotland. His business career was commenced in Montreal as an importer and general commission merchant. He soon realized, however, the possibilities of a large tobacco business in Montreal and it was in this that he made the millions that later were given so generously to McGill University and to Macdonald College. Upon the death of Lord Strathcona, in 1914, Sir William was made Chancellor of the University. Among his gifts to McGill were the Engineering Building, which was burnt down and rebuilt, the Macdonald Physics Building, the Chemistry and Mining Buildings, the McGill Union, the Macdonald Park at the foot of the Mountain, and the Stadium—one of his most recent gifts; and, in addition, large sums of money for the endowment of various chairs and for equipment and other purposes. In New Brunswick, Nova Scotia, and Prince Edward Island, Sir William established the Macdonald Consolidated Schools as a means of improving education in rural districts, and in order to foster interest in agriculture he built Macdonald College, that magnificent pile of buildings at Ste. Anne de Bellevue on the banks of the Ottawa River. He was knighted in 1898. Among the bequests made by Sir William Macdonald was a gift of five hundred thousand dollars to the Faculty of Medicine of McGill University, an equal amount to the Montreal General Hospital, and the sum of one hundred thousand dollars to the Maternity Hospital. Although he came of an old Jacobite family, Sir William left the Roman Catholic Church as a young man. He never joined any other religious body. His remains were cremated in the beautiful crematorium in Mount Royal cemetery, which was built and endowed by him some years ago.

Under the direction of Major J. W. S. McCullough, in Hamilton, the first week of June was devoted to acquiring information relative to the care and feeding of infants, the health of the mother and the attention she received at the time of the infant's birth, the financial condition of the parents, and other points bearing on the possible causes of infant mortality. The information will be tabulated for future reference in connexion with the baby welfare movement. It is well to remember that in Canada 102 babies out of every thousand that are born die within twelve months of birth.

The following resolution was recently published by the medical authorities of Scotland: "The faculties of medicine of the universities and councils of the Royal College of Surgeons of Edinburgh and of the Royal Faculty of Physicians and Surgeons of Glasgow desire to record their condemnation and detestation of the neglect and inhumanity which characterized the conduct of certain members of the Prussian medical staff to whom the treatment of British prisoners of war was intrusted, especially in the internment camps at Wittenberg and Cardlegen during outbreaks of typhus fever which had been largely provoked by overcrowding, insufficent food, and the entire absence of all sanitary measures. The facts as stated in the recent report of a British government committee, which are based mainly on the testimony of officers of the Royal Army Medical Corps, themselves prisoners of war, are of such a nature as to bring indelible disgrace upon the physicians concerned, and upon the German government, which remains ultimately responsible for the treatment meted out to prisoners of war. As members of a profession which has hitherto, in every quarter of the civilized world, been inaccessible to the shameful influences which make for barbarity in warfare, we are reluctantly forced to the conclusion that a spirit of gross inhumanity has not been absent from the Prussian medical service."

Miscellany

Book Reviews

THE NEWER METHODS OF BLOOD AND URINE CHEMISTRY. By R. B. H. GRADWOHL, M.D., director of the Pasteur Institute of St. Louis; and A. J. BLAIVAS, assistant in the same. 226 pages with sixty-five illustrations and four colour plates. Publishers: C. V. Mosby Company, St. Louis, 1917. Price, $2.50.

THIS little book of laboratory directions is what is needed by many of our hospital laboratories which are just starting the newer quantitative methods of blood and urine analysis. It collects together in an easy way, what is very often a difficult task, the practical methods for the estimation of the different blood constituents, the majority of which are now beginning to assume a more fixed and definite form. The illustrations in the book, too, are very helpful. We must, however, confess ourselves surprised at the strong advocacy of the Hellige colorimeter as against the Duboscq. Work in this field must be accurate, if the diagnosis or prognosis is to be of value, and the highest accuracy is not too much. Part III of the book is especially valuable as it is in the interpretation of his results that the beginner finds most difficulty. The references to the literature, too, should encourage the reading of the original articles, as no set of directions has yet been given for any analytical process which can be followed entirely mechanically, and an intelligent appreciation of the difficulties can only be obtained by observing the spirit as well as the letter of the instructions. This can usually be found in the original paper.

THE following candidates successfully passed the recent examinations of the Medical Council of Canada, held at Toronto during the week commencing June 19th: C. C. Birchard, M. F. Congdon, E. Couture, A. B. Holmes, I. R. McKendry, and I. A. Young.

Obituary

CAPTAIN ROBERT HOME, R.A.M.C.

Captain Robert Home, R.A.M.C., was killed in action in France on April 22nd. He was twenty-six years of age and a graduate in medicine of the University of Toronto. At the time he enlisted he had been in practice for about three years in Toronto and had already given promise of a brilliant future. In October, 1915, he joined the Seventeenth Field Ambulance, C.E.F., and with that unit went to England where he was transferred to the R.A.M.C. Captain Home returned to Canada on a short furlough last November and the following month went back to France. Dr. Home was a demonstrator in anatomy in the University of Toronto and was also on the staff of the Toronto General and the Grace Hospitals.

HAMILTON WRIGHT, M.D.

In the death of Hamilton Wright, which occurred recently at Washington, McGill has lost another son of whom she is justly proud. A Canadian by birth and education, Dr. Wright's professional career, although largely spent away from Canada, was begun under the inspiration of Professor J. J. Adami, of McGill University. After graduating in 1895, he entered the University of Cambridge as a John Lucas Walker scholar and devoted himself to the study of neuropathology. He then returned to McGill University and conducted a series of studies on the spinal cord under the direction of Professor Adami. Subsequently Dr. Wright became assistant to Dr. F. W. Mott, at the Pathological Laboratory, Claybury. There he worked at the pathology of tabes and made a number of experiments on animals with the view of demonstrating chromatolytic changes in the ganglion cells of the brain by prolonged chloroform narcosis. Later on Dr. Wright was appointed by the Colonial Office to conduct an investigation into beri-beri in the Straits Settlements. While engaged in this work, he was able to induce the authorities to build the admirably equipped laboratory at Kuala Lumpur. His researches led him to the conclusion that the disease was probably due to some microörganismal toxin and that food, including rice, was merely a mode of transmission of the infective agent. In 1909, Hamilton Wright was appointed by President Roosevelt to the International Opium Commission. He was an able scientist, possessed of marked administrative ability and a facile gift of expression. His death was the sequel to injuries received in a motor-car accident in France, where he was engaged in relief work. A widow and five children survive him.

JAMES RUSSELL, M.D.

Dr. James Russell, who died at Hamilton on May 31st, was born in Lanarkshire, Scotland, in the year 1843. For more than twenty years he was superintendent of the Hamilton Asylum, a post for which his experience and administrative ability made him eminently fitted. As an alienist Dr. Russell enjoyed a wide reputation. He was a member, and at one time president, of the American Medico-Psychological Society, and for six years a member of the Ontario Medical Council, being elected to that body in 1885. It was as a boy of thirteen that James Russell first came to Canada and settled with his parents at Hay, in the Province of Ontario. After attending the public schools at Hay for some years, he entered the Normal School at Toronto, where he graduated with honours. He then taught for two years but devoted his spare time to the study of medicine. He entered the New York College of Physicians and Surgeons and finished his medical course at Toronto University, where he obtained his M.D. degree in 1869. The following years were spent in general practice in Hamilton and in August, 1869, Dr. Russell was appointed superintendent of the Asylum. He leaves a widow and grown up family. A daughter, Miss Elizabeth Russell, who is now matron of the Duchess of Connaught Canadian Red Cross Hospital, was recently awarded the Royal Red Cross of the First Class by His Majesty the King.

Dr. Willard D. Sorensen, who died at Leavitt, Alberta, on May 3rd, was the eldest son of Mr. and Mrs. Willard Sorensen, of Cardson, Alberta, He was a graduate of the medical school of Western University and was in practice at Edgerton, Alberta. His death followed an operation for appendicitis. A widow and young child survive him.

Dr. S. H. Goodwin, whose death occurred in Detroit on May 15th, was born at South Oxford, Ontario, in 1849.

Dr. Weston William Milburn, of Macleod, Alberta, who died on May 26th, was a graduate of Trinity Medical College, Toronto, of the year 1903. He was well known as a practitioner in Milburn and the surrounding district.

Dr. Parker Peacock, a graduate of the University of Toronto, was accidentally killed at Calgary on May 7th, while in a motor car driven by his brother Lieutenant-Colonel M. B. Peacock. The automobile was struck by a street car.

Dr. James Rutherford, of Orono, Ontario, died May 14th. He was a graduate of Queen's University of the year 1870.

News

ONTARIO

Dr. Edward Thomas Hoidse, of Toronto, has been made a member of the Royal College of Surgeons.

In response to a request from the Ontario Association for the Feebleminded, a meeting was held in Hamilton on May 16th, at which the following resolution was passed: That in the opinion of this meeting of representative citizens, it is advisable, and in the best interests of the city, that a local branch of the Provincial Association for the Care of the Feebleminded be formed; and that a committee for that purpose be forthwith nominated.

One hundred and forty cases of typhoid fever, two of which ended fatally, were reported in Orillia during a period of three weeks. Investigation revealed the fact that the epidemic had been caused by infection transmitted by milk supplied from a farm where several cases of the illness had occurred.

The Hospital at Wingham at is to be enlarged.

Captain J. H. Elliott, M.D., C.A.M.C., of Toronto, has been elected president of the American Climatological and Clinical Association.

QUEBEC

Dr. Tanney, of Montreal, has been appointed medical superintendent of the General Hospital. Dr. Tanney is a graduate of McGill University.

MANITOBA

The plans are in course of preparation for an addition to the King Edward Hospital at Winnipeg.

MANITOBA

Dr. Lyle John Cameron, of Winnipeg, has been created a Fellow of the Royal College of Surgeons.

Dr. John McDiarmid, of Brandon, has been appointed physician to the jail in succession to Dr. Clark.

MEDICAL COLLEGES

Toronto University.

The distinction of Knight Commander of the Order of St. Michael and St. George has been conferred by His Majesty King George upon Robert Alexander Falconer, President of the University of Toronto.

The following fourth-year medical students have joined the British Navy as sub-surgeons: W. E. Johnston, of Toronto; H. S. Little, of Ridgetown; H. I Palmer, son of Colonel R. H. Palmer, M.D., of Brantford, and H. I. Quinn, of Castleton.

Laval University

The degree of M.D. has been conferred by Laval University, Quebec, upon the following candidates who were successful in passing the recent examinations: Rosario Poitras, of St. John; Jean Deschaillons, G. Talbot, of Quebec; Paul Marceau, of Quebec; J. J. Roy, of St. Anselme; Ludovic Lavallée, of St. Anne de la Pocatière; Camille Lavoie, of St. Joseph d'Alma; and Eugene Guillemette, of Lawrence, Massachusetts.

Western University

THE following is the list of candidates who were successful in passing the medical examinations at Western University, and upon whom the degree of M.D. has been conferred: F. J. H. Campbell, B.A., London, gold medalist; H. O. Foucar, son of a missionary in China, silver medalist; E. N. Ballantyne, W. L. Denny, J. A. Renwick and J. M. Young, London; D. D. Ferguson, C. J. A. McKillop and F. H. Nelson, St. Thomas; L. M. Jones, Chesley; A. J. McKay, Woodstock; R. S. Murray, Galt, and C. J. Shore, Glanworth.

ARMY MEDICAL SERVICES

AMONG recipients of the King's birthday honours are two members of the Canadian medical services: Surgeon-General Fiset, the Deputy Minister of Militia, who is made Knight Bachelor, and Colonel Charles Alfred Hodgetts, who is given the distinction of Commander of St. Michael and St. George. During the past three years Sir Eugene Fiset has thrown himself heart and soul into the work of directing the mobilization and equipment of the overseas forces. Colonel Hodgetts, as is well known, is the Director of the Canadian Red Cross overseas.

THE Distinguished Service Order has been awarded to Lieutenant-Colonel D. McQueen, formerly medical superintendent of the Winnipeg General Hospital and Commanding Officer of the 11th Western Field Ambulance, C.E.F., and to Captain Hymen Lightstone, R.A.M.C., of Montreal. Captain Lightstone received the medal of honour from the French Government a few months ago.

THE President of France has conferred upon Colonel E. A. Lebel, officer commanding No. 8 Canadian General Hospital, now stationed at St. Cloud, the decoration of *Chevalier de la Légion d'honneur.* Captains Parizeau, Petitclerc and Saint Pierre are made *officers de l'instruction publique,* and Captains Lafleur, Forgues, Millette, Roy, Bourgeault, and Clerck *officiers d'académie.* The *médaille de vermeil des épidémies* has been awarded to Miss Decormier.

THE Silver Medal for Military Valour has been awarded by His Majesty the King of Italy to Captain Howard Hampton Burnham, C.A.M.C.

THE Military Cross has been awarded to Captain Frank L. McKinnon, B.A., M.D., of Winnipeg, and to Captain Frank M. Walker, M.D., of Stony Creek, Ontario, for conspicuous bravery shown in the carrying out of duties in connexion with the Royal Army Medical Corps.

THE following members of the Canadian Army Medical Corps were mentioned in despatches by General Sir Douglas Haig at the beginning of June: Colonel J. T. Fotheringham; Lieutenant-Colonels K. Cameron, J. M. Elder, C. F. McGuffin, J. D. McQueen, G. R. Philp, C. F. Wylde; Majors A. T. Bazin, P. G. Bell, C. H. Dickson, A. L. Gilday, G. S. Mothersill, G. H. Wilson; Captains T. H. Bell, H. Buck, J. C. Clarke, A. W. Ellis, D. B. Kennedy, C. Kerr, A. F. Laird, W. G. Lyall, A. McCausland, R. R. McClenahan, H. R. Mustard; Sergeant-Majors Gardner and Pearson; Sergeants F. Baxter, S. H. Bye, C. Hay, G. H. Iliffe, W. G. Neish; and Corporals E. Miller and T. W. Whitefoot. *Nursing Service:* Miss M. E. McIntosh, Miss B. O. Maguire, and Miss M. E. Stevens.

THE names of the following members of the Canadian Red Cross were also mentioned by Sir Douglas Haig: Miss M. I. Burns, Miss M. MacFarlane, and Miss B. M. MacIntosh.

THE Bronze medal for military valour has been awarded to Private William Bateman, C.A.M.C.

THE Royal Red Cross of the First Class has been awarded to Nursing Sisters Anne Forest and Jean Matheson; this decoration, of the second class, has been awarded to Sisters Louise Brock, Harriet Graham, Laura Gamble, Mabelle Jamieson, Kathleen Little, Lizzie MacEachern, Georgianna McCullough and Mary Morrison.

DISTINGUISHED Conduct and Meritorious Service Medals have been awarded to the following non-commissioned officers and men: Sergeant D. G. Bell, Sergeant-Major G. P. Blanchard, Sergeant W. A. Cooper, Corporal W. Danby, Private A. B. Davies, Corporal J. Evans, Sergeant C. N. Foster, Corporal J. Giles, Corporal T. H. Goodeve, Sergeant-Major P. V. Harcourt, Sergeant L. B. Hughes, Corporal A. J. Langford, Sergeants L. M. Larsen, P. B. Legg and N. V. Levy, Sergeant-Major R. B. Lloyd, Sergeant-Major P. W.

Macfarlane, Bombardier P. W. MacNevin, Sergeant-Major F. J. Marshall, Sergeant D. McAndie, Sergeant-Majors E. Nicholls and J. Patterson, Sergeant J. Paul, Corporal P. Quinn, Sergeants G. W. Simms and W. J. Squibb, Private G. Tomlinson, Sergeant-Majors W. Vagg and W. Wallis, Private J. Wilson, Sergeant C. F. Airey, Drivers C. S. Althouse and A. Blatchford, Sergeants G. L. Brody, J. J. Coull, W. Davidson, J. A. Hunting, E. S. Keeling, J. Lamb, McL. Norton and A. G. Ovenden, Corporal J. J. Quittenton, Sergeants Smallman and R. Snelson, Sergeant-Major O. O. Wilson, Private S. C. Wise.

THE appointment is announced of Major Thomas Dickson Archibald, C.A.M.C., of Cobourg, Ontario, as chief medical officer of the Whitby Military Hospital, in succession to Lieutenant V. Storey, who has been transferred to the Spadina Military Hospital, Toronto. Major Archibald went overseas with the 8th Canadian Mounted Rifles and returned to Canada last February.

LIEUTENANT-COLONEL H. ERNEST KENDALL, C.A.M.C., of Sydney, Nova Scotia, is now in command of the St. Francis Xavier Hospital, which is stationed at Bramshott.

LIEUTENANT-COLONEL A. J. MACKENZIE, C.A.M.C., of Toronto, has been transferred from the Moore Barracks Hospital at Shorncliffe to take command of the Princess Patricia's Red Cross Hospital at London.

LIEUTENANT-COLONEL ARTHUR WINTERS has been appointed A.D.M.S. of the Quebec Military District. Lieutenant-Colonel Winters was formerly in practice at Toronto and at the time of the outbreak of the war, was engaged in post-graduate work in England.

PROMOTIONS in the Canadian Army Medical Corps: to be Lieutenant-Colonel, Major P. G. Bell, of Winnipeg.

THE following doctors are among those who have recently joined the C.A.M.C.: Dr. G. W. Gibbs, of Selkirk, and Dr. W. O. Henry, of Brandon, Manitoba; Dr. W. Lemesurier, of Quebec; Dr. J. A. Bell, of London, Ontario.

LIEUTENANT-COLONEL GEORGE R. PHILP, C.A.M.A., of

Toronto, has been appointed A.D.M.S. at Petawawa Camp. Lieutenant-Colonel Philp has been in command of the 10th Field Ambulance, C.E.F. He was recently mentioned in despatches by Sir Douglas Haig.

Dr. J. W. McIntosh, member of tthe Legislature of British Columbia, has left Vancouver for London to join the Royal Army Medical Corps.

Dr. J. H. Carson, of Vancouver, has accepted the appointment of medical superintendent of the Langara Convalescent Hospital, with the military rank of Captain.

CASUALTIES.

Wounded

Captain Bernard McCullough, C.A.M.C., of Oshawa, Ontario.

Captain H. C. Wallace, C.A.M.C.

Captain Arthur Chester Armstrong, C.A.M.C., of Alexander, Manitoba.

Captain K. G. Macdonald, C.A.M.C., of Toronto.

Captain W. T. Ruggles, C.A.M.C., of Middleton, Nova Scotia.

Canadian Literature

Original Contributions

The Canadian Journal of Medicine and Surgery, April, 1917:

Certain diseases of the skin in regard to the public health	D. King Smith.

The Canadian Practitioner and Review, April, 1917:

Hydatid of the lung—Report of two cases	F. Arnold Clarkson.
The radium treatment of malignant disease of the lip and skin . . .	W. H. B. Aikins.

Medical Societies

MEDICAL COUNCIL OF CANADA

THE fifth annual session of the Medical Council of Canada was held at Ottawa on June 12th and 13th, 1917, under the presidency of Dr. Walter W. White, of St. John, New Brunswick.

There were present: Sir Thomas Roddick, Dr. E. A. Braithwaite and A. MacG. Young, representing the Governor-in-Council; Dr. C. K. Clark, Toronto University; Dr. E. P. Lachapelle, Laval University, Montreal; Dr. A. D. Blackader, McGill University, Montreal; Dr. H. A. McCallum, Western University; Dr. E. S. Popham, Manitoba University; Dr. P. C. Dagneau, Laval University, Quebec; Dr. D. Fraser Harris, Dalhousie University; Dr. J. C. Connell, Queen's University; from Ontario: Drs. W. Spankie and H. S. Griffin; from Quebec, Drs. A. Simard and L. P. Normand; from New Brunswick, Drs. W. W. White and G. C. VanWart; from Prince Edward Island, Drs. A. MacNeill and P. Conroy; from Manitoba, Hon. Dr. Thornton and W. Rogers; from Saskatchewan, Drs. W. J. S. Millar and H. E. Eaglesham; from Alberta, Hon. Dr. Brett and F. W. Crang; from British Columbia, Drs. R. E. Walker and R. E. McKechnie; representing the Homœopathic Body in Canada, Drs. E. M. Morgan, C. E. Sugden and C. E. Jarvis.

A resolution was passed expressive of the regret of Council at the death of the late Dr. J. S. Gray of Winnipeg, one of the original members of Council.

The President then addressed the Council *viva voce* and touched upon certain matters of importance in reference to the Council and to the profession at large.

The Registrar's report showed that since the 1916 meeting of Council he had registered thirty-six men under the ten year clause in the Act. He also reported in detail upon the examinations conducted by Council in Toronto in June, 1916, and in Montreal in October, 1916, showing that a total of thirty-five had successfully passed in the two examinations and had been duly included in the Canada Medical Register. His report concluded with the auditor's statement of the receipts and expenditures for the year closing March 31st, 1917.

An important request was received from the Deputy Minister of Militia requesting the Council to assist the Department by reporting on certain questions submitted concerning the supply of medical practitioners for the war from each province, whether particular localities were being denuded of medical men to the detriment or prejudice of the public living therein, and also as to the work of training medical men in the various medical schools, hospitals and public health services. A committee consisting of Drs. A. MacNeill, D. F. Harris, G. C. VanWart, A. Simard, J. C. Connell, C. E. Sugden, Hon. Dr. Brett, A. MacG. Young and R. E. Walker was appointed by the president to consider and report upon the request of the Deputy Minister, its work to be continued after the adjournment of Council. This committee subsequently met and elected Dr. J. C. Connell as chairman.

A detailed report was received from a committee of the Board of Examiners suggesting certain alterations tending to improve the existing regulations. It was favourably received and acted upon.

Two important resolutions were submitted; one upon the question of instituting a scholarship, and the other upon appointing a committee to inspect and report upon the various medical schools in Canada. These were ordered referred to the Council's solicitor and General Council.

The Education Committee reported that an examination be ordered to be held at Montreal and Halifax on the second Tuesday in October, 1917, and at Toronto and Winnipeg coincidently on the third Tuesday in June, 1918. The report was adopted.

The Executive Committee also presented in detail a nomination for the Constitution of the Board of Examiners for the October Examinations, 1917, and for the June Examinations of 1918. The nomination was accepted and passed.

The Finance Committee presented a detailed report written upon the operations of the Council, which was received and adopted.

It was moved by Dr. McKechnie, seconded by Dr. Connell, and carried: That a special committee consisting of Hon. Dr. Thornton, Dr. P. C. Dagneau, Dr. J. C. Connell and Dr. C. E. Jarvis be authorized to enter into negotiations with the Provincial Councils for coöperation in conducting examinations and for the purpose of establishing the examinations of this Council as the single portal for qualification in the Dominion of Canada.

The question of dividing the examinations of the Council into Primary and Final so that undergraduates could take the primaries when certificated from their Alma Mater that they had successfully passed in the subjects in their respective schools, was referred to the special committee consisting of Drs. Thornton, Dagneau, Connell, and Jarvis. The whole question of reciprocity was referred for report to the same committee.

The nominating committee presented its report, as follows: hon. president, Sir T. Roddick; president, Dr. E. P. Lachapelle; vice-president, Dr. R. Eden Walker; registrar, Dr. R. W. Powell; general counsel, Mr. F. H. Chrysler, K.C.; auditor, Mr. G. L. Blatch, F.C.A. The report was adopted. The retiring president, Dr. W. W. White, inducted Dr. E. P. Lachapelle in the chair.

MEDICAL LIBRARY ASSOCIATION MEETING

The twentieth annual meeting of the Medical Library Association was held in New York on June 4th and 5th, and in Brooklyn on June 6th. Representatives from the libraries of the following institutions were present: Cleveland Medical Society, College of Physicians and Surgeons of New York, College of Physicians and Surgeons of Philadelphia, Denver Medical Society, Harvard Medical Society, Jefferson Medical College, Johns Hopkins Hospital, Luzerne County Medical Society, Medical Faculty of McGill University, Medical and Chirurgical Faculty of Maryland, Department of Health of New York City, Medical Department of New York State Library, New York Academy of Medicine, Rockefeller Foundation, Rockefeller Institute, Rush Medical College, Medical School of Syracuse University, Toronto Academy of Medicine, Medical School of the University of Georgia, Wayne County Medical Society,

The papers read, all of which were exceedingly practical and of equal interest to the practioner and the librarian, placed before the association various ways and means in which libraries can be of the greatest benefit to the greatest number. In a paper entitled, "The pamphlet as a library tool," it was shown in how many ways the pamphlet might be of value—its utility lying largely in its smallness of size, as a greater mass of material in such form can more easily be circulated than the same amount of literature found only in a bound periodicals.

With regard to the use of the photastat in libraries, it was pointed out that with no risk of damage to the original work, rare and valuable volumes, which otherwise could not be consulted outside the library, were thus made available.

The paper on "War bibliography" was of particular interest. The subject headings under which it is suggested to collect material should prove of great assistance in rendering information easily accessible. Such a bibliography would be of great practical value and it should become generally known among medical men, especially those on active service, that such articles are being tabulated, or in some other way brought together.

ONTARIO MEDICAL ASSOCIATION

THE thirty-seventh annual meeting of the Ontario Medical Association was held in the Mining Building, University of Toronto, on May 30th, 31st, and June 1st, 1917. The committee of general purposes met on the evening preceding (May 29th) and discussed fully the proposed by-laws and constitution. At 10 a.m. the president, Dr. A. Dalton Smith, took the chair at the business session. After the reading of the minutes, the following reports were received and adopted: Treasurer, Secretary, Arrangements, Papers and Business, Public Health, Necrology and Workmen's Compensation. The committee on by-laws, and the executive committee were to report at the next business session.

In the afternoon session, Dr. James J. King, of New York, presented a paper on the "Tonsillar infections as a source of systemic disease", and Dr. W. W. Chipman, of Montreal, read the Address in Gynæcology.

The following were elected on the nominating committee: Drs. Mullin, Bingham, Cleland, Anderson, Cameron, Clarkson, Lusk, McGregor, Ferguson, Powell, Goldie, Rogers, Morton, Parry, Middleborough, Dalton Smith, Argue.

At 5 p.m. a short business session was held, the president in the chair. Dr. G. S. Cameron presented the report of the committee on by-laws. It was moved by Dr. Cameron and seconded by Dr. Anderson that the committee be requested to continue their work and to bring in a report at the annual meeting of 1918. Moved in amendment by Dr. Mullin and seconded by Dr. Marlow, that the committee continue their work, and that a special meeting of the Association be called on or before November 1st, to pass upon the provisional constitution. This amendment was carried.

At the evening session, the president, Dr. A. Dalton Smith, presented his address, and Dr. Henry A. Christian, Boston, delivered the Address in Medicine.

The morning of Thursday was devoted to the meetings of sections. At the afternoon session, Dr. W. W. Babcock, of Philadelphia, delivered the Address in Surgery, and Dr. J. E. McKenty, read a paper on "Laryngectomy."

At the business session the nominating committee reported as follows: Next place of meeting, Hamilton; president, John P. Morton; 1st vice-president, Dr. G. Stewart Cameron; 2nd vice-president, Dr. John Ferguson; 3rd vice-president, Dr. J. M. Rogers; 4th vice-president, Dr. J. F. Argue; general secretary, Dr. E. Arnold Clarkson; assistant secretary, Dr. F. C. Harrison; treasurer, Dr. J. H. Elliott; executive committee, Drs. John Sheahan and N. H. Beal; representatives to the Canadian Medical Association, Drs. H. B. Anderson, D. J. Gibb Wishart, R. J. Hamilton.

The following were added to the committee: credentials, J. R. Parry, Geo. A. Shannon; public health, H. W. Hill, A. J. McCauley, J. W. S. McCullough; publication, E. E. King, G. W. Elliott, John Ferguson; ethics, W. H. B. Aikins, P. L. Scott.

The treasurer's report and the report of the executive were then received and adopted.

A resolution was moved by Dr. Morton, seconded by Dr. Campbell, and carried, that the Ontario Government appoint a Royal Commission to make inquiry into the subject of the care of the feeble-minded and insane in the Province of Ontario to the end that more adequate means may be adopted for dealing with the problem of prevention and of scientific treatment of the insane and feeble-minded.

It was moved by Dr. King and seconded by Dr. Hamilton, that the president appoint a committee to deal with the question of venereal diseases. This was also carried. Subsequently the president named Drs. E. E. King (convener), Charles Hair, H. J. Hamilton, A. Dalton Smith, R. S. Hutchison, J. G. Fitzgerald, R. W. Mann, J. F. Morton, G. S. Cameron and E. R. Secord as members of this committee.

The president then installed the president-elect, Dr. J. P. Morton, of Hamilton.

At 4.30 the president and Mrs. A. Dalton Smith held a reception in the Academy of Medicine.

At the evening session, two papers were presented, one by Dr. Nelson, and one by Professor Sharpe, of New York. Friday morning was devoted to meetings of sections.

ONTARIO HEALTH OFFICERS' ASSOCIATION

The Ontario Health Officers' Association held its sixth annual meeting in the Medical Building of the University of Toronto on

Tuesday and Wednesday, May 29th and 30th. The attendance was upwards of 300. The meeting was held as a general session during the first day and upon the second day was divided into a general session and one upon public health administration. Dr. A. J. Macaulay, M.O.H., of Brockville, made an ideal presiding officer. Suitable reference was made to the death of the late vice-president, Dr. Vardon, of Galt.

The first session included a discussion on "Venereal Diseases", the paper, with slides, being given by Dr. Gordon Bates, of Toronto. The discussion was carried on by Drs. C. H. Hair, C. E. Trow and others. The subject of "Infantile paralysis" was presented by Dr. H. W. Hill, M.O.H., of London, who gave a most instructive paper upon this subject. Papers upon the same subject were given by Drs. Durocher and Cruickshank, of Windsor, and by Dr. Green, of Stoney Creek. There was a free discussion led by Dr. Amys, M.O.H., of Peterborough.

In the afternoon session, after a short address by the president, Dr. C. J. Hastings gave on behalf of the Mayor an address of welcome. This was succeeded by the address of the day given by Professor C. E. A. Winslow, head of the Public Health Department, Yale School of Medicine, New Haven, upon the subject of "Safeguarding the health of young children". Professor Winslow's address gave a description of some practical methods of life-saving. He pointed out that the campaign carried on in New York had reduced the infant mortality rate in that city, from 154 in 1900 to 93 in 1916, which means a saving of over 8000 lives a year. Recent estimates of the comparative value of various lines of public endeavour showed that infant welfare work offers one fifth of the total possibilities of life-saving which are open to the health department.

Professor Winslow pointed out that every community of ten thousand inhabitants should have not a "milk station" merely but a baby's clinic and dispensary where children may be brought for weekly examination and from which public health nurses may go out to carry instruction to the home of the individual mother. In larger cities there should be such a station for every twenty thousand population. The nurses should also undertake the prenatal care of mothers. The experience of Boston had shown that such care may result in cutting the infant mortality to one half the figure prevailing among families not receiving prenatal advice. For the rural communities there should be public health nurses backed by available competent pediatric knowledge which might be secured by coöperation with the infant welfare organization of the nearest city (*or with that of the Provincial Board of Health*).

Professor Winslow went on to say that the deaths of infants were due principally to three great groups of causes: (1) Prematurity or congenital debility and other causes operating at the time of birth; (2) Gastro-intestinal infections; (3) Pneumonia and other respiratory diseases. The machinery of the infant welfare station helped in dealing with all of these groups and more especially with the second, namely, summer diarrhœas and other digestive disorders. Means of procuring adequate and safe milk supplies were indicated in the paper and the value of inspection and pasteurization pointed out. The importance of measles and whooping-cough as public health problems were discussed, especially in the very earliest years. The fatality of whooping-cough is five times as great under one year as over five years, of scarlet fever ten times as great, and of measles twenty times as great. These facts indicate the great necessity for the protection of young children against infection. Schools should *never* be closed during epidemics. The services of the public health nurse should be secured and an examination of the school children made every morning for the detection of the disease in its earliest stages. Professor Winslow's paper is of the greatest value and should be read by every health officer.

The Hon. W. D. McPherson, provincial secretary, gave a short address of welcome to the members of the Association, in which he showed evidence of great interest in public health matters. His address was received with great enthusiasm.

Dr. Charles J. Hastings and Dr. J. F. Hanly each gave comprehensive addresses upon public health nursing.

Dr. F. D. Canfield read a paper on "The adrenals" and the chairman of the Provincial Board, Dr. Adam Wright, spoke upon "Rest and sleep as factors in disease prevention".

On the second day the morning session of the Association was carried on in two sections. The general session included papers upon "Sex hygiene" by Dr. N.W. Woods, and "Mendelism" by Dr. James Roberts. There were two splendid papers on the subject of "Tuberculosis", one by Dr. D. R. Craig and the other by Dr. A. R. Hanks. Dr. Jenner discussed "The public school as a place of instruction in practical sanitation".

In the section on Public Health Administration there were papers upon the "Difficulties of medical officers," by Drs. Macdonald, D. A. Kidd and F. H. Mitchell, on the "Education of the public," by Dr. H. Logan, upon the "Public Health Act," by Dr. A. Nichol, and upon the "Relationship of the District Officer to the M.O.H. of the municipality," by Dr. G. F. Richardson.

A most excellent paper upon "Ways and means of conducting public health in the average town" was given by Dr. C. A. Patterson, and one upon "Some practical points in enforcement of the regulations," by Dr. H. Ross. Dr. W. Doan, of Harrietsville, and Dr. F. King, of St. Catharines gave interesting papers upon their "Experiences as medical officers of health."

On the afternoon of this day the session was entirely taken up by papers on the subject of "Epidemiology". Measles, Scarlet Fever, and Diphtheria, were discussed by Drs. A. A. Metcalfe, J. C. Hutchinson and A. H. Speers. "Variola" was the subject of a paper by D. J. P. Boyle, while "Disinfection" was discussed by Drs. R. K. Anderson and James Campbell.

The matter of "Communicable diseases" was the subject of papers by Drs. J. H. Howell, W. R. Mason, and James McPotts, and Dr. S. F. Millen ably handled the question of "Typhoid fever in rural communities". All these matters led to general and wide discussion. Drs. Fitzgerald and McCullough answered the questions submitted in the "Question Drawer".

The officers and committees elected were as follows: president, Dr. H. W. Hill, M.O.H., London; 1st vice-president, Dr. G. F. Cruickshank, M.O.H., Windsor; 2nd vice-president, Dr. E. A. Williamson, M.O.H., Kingston; secretary, Dr. J. W. S. McCullough, Toronto.

The committee on papers and arrangements comprises Drs. G. A. Dickinson, J. J. Harper and J. W. S. McCullough.

HALIFAX MEDICAL SOCIETY

The Halifax Medical Society held its annual meeting at the Nova Scotia Hospital, Dartmouth, on May 16th.

A report was received from the executive committee relating to the results of the meeting with the representatives of the government on the subject of grievances under the Workmen's Compensation Act. The deputation reported that certain reforms or amendments to the Act, which had been informally promised to be carried out, had not been; the committee in charge of this matter was continued and instructed to interview the government representatives again.

It was agreed to refer the matter of adopting the decimal system in prescribing drugs to the meeting of the Nova Scotia Medical Society, which meets early in July in Halifax, under the presidency of Professor Fraser Harris.

The following officers were elected for next session: president, Major John Cameron, M.D., professor of anatomy, Dalhousie University; vice-president, Captain Lawlor, M.D., superintendent of the Nova Scotia Hospital; secretary-treasurer, Captain Hugh Schwartz.

Dr. Moore, of the Nova Scotia Hospital, demonstrated three cases of very early general paralysis in men. Captain Lawlor read an instructive paper on "General paralysis."

NORTH WATERLOO MEDICAL ASSOCIATION

The annual meeting of the North Waterloo Medical Association was held at Kitchener, Ontario, on May 17th, Dr. W. G. Hilliard, of Waterloo, in the chair. The attendance was good and it was decided that the Association should be affiliated with the Ontario Medical Association. A paper on "Blood transfusion" was read by Dr. Callahan, and the history of a case of extra uterine pregnancy was given by Dr. H. M. Lackner. The election of officers for the year 1917–18 resulted as follows: president, Dr. F. H. Kalbfleisch; vice-president, Dr. F. H. Weidenheimer; secretary, Dr. J. E. Hett, of Kitchener; treasurer, Dr. T. H. Callahan.

PETERBOROUGH MEDICAL ASSOCIATION

The annual meeting of the Peterborough Medical Association was held in the rooms of the association in the Public Library on April 26th.

A goodly number of the members were present, and after the presentation of the very satisfactory annual reports from the different committees, the following officers for the ensuing year were elected: Honorary president, Dr. Ford; president, Dr. Mann; first vice-president, Dr. Scott; second vice-president, Dr. Buchanan; secretary, Dr. Cameron, 318 Stewart Street; treasurer, Dr. McCulloch.

The report of the library committee showed that the society now owns several hundred books and is adding a number yearly through the setting aside of a certain amount of the annual income for the purchase of books.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. A. D. Blackader, Montreal. President-elect—Dr. James McKenty, Winnipeg. Secretary-treasurer—Dr. J. W. Scane, 836 University Street, Montreal.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. D. J. Gibb Wishart. Secretary—Dr. J. H. Elliot, 11 Spadina Road. Treasurer—Dr. J. H. McConnell.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. W. A. Lincoln, Calgary. Secretary-treasurer—Dr. D. G. Revell, University of Alberta, Edmonton South.
Annual Meeting, Calgary, 1917.

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett, A.M.C., Ottawa.

ASSOCIATION OF MEDICAL OFFICERS OF NOVA SCOTIA—President—Dr. George E. DeWitt, Wolfville. Secretary—Dr. W. W. Hattie, Halifax.

BRANT COUNTY MEDICAL SOCIETY:—President—Dr. E. R. Secord, Brantford. Secretary—Dr. M. N. Faris.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL SOCIETY:—President—Dr. J. L. Allen. Secretary—Dr. J. E. Aikenhead. Treasurer—Dr. W. Shipley.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Hon. J. W. Daniel, M.D., St. John. Secretary—Dr. George D. Porter, Ottawa.
Annual meeting, September 26th, 1917.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. M. E. Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. J. D. Pagé, Quebec. Secretary—Dr. J. G. Fitzgerald, University of Toronto.
Annual meeting, Ottawa, September 27th and 28th, 1917.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

COLCHESTER-HANTS MEDICAL SOCIETY:—President—Dr. J. W. T. Patton, Truro. Secretary—Dr. H. V. Kent, Truro.

EDMONTON ACADEMY OF MEDICINE:—President—Dr. C. U. Holmes. Secretary-treasurer—Dr. E. L. Garner. Library, 12 Credit Foncier Building.

ELGIN COUNTY MEDICAL ASSOCIATION:—President—Dr. G. A. Shannon, St. Thomas. Secretary-treasurer—Dr. W. F. Cornett, St. Thomas.

FRASER VALLEY MEDICAL SOCIETY:—President—Dr. DeWolfe Smith. Secretary—Dr. D. F. Carswell.

HALIDMAND COUNTY MEDICAL ASSOCIATION:—President—Dr. Hopkins, Dunnville. Secretary—Dr. Courley, Cayuga, Ont.

Medical Societies—*Continued*

HALIFAX MEDICAL SOCIETY:—President—Dr. John Cameron. Secretary-treasurer—Dr. Hugh Schwartz.

HAMILTON MEDICAL SOCIETY:—President—Dr. R. Y. Parry. Corresponding Secretary—Dr. Fred Harper. Treasurer—Dr. T. W. Blanchard.

HURON MEDICAL ASSOCIATION:—President—Dr. Machell. Secretary—Dr. Hunter, Goderich, Ont.

KINGSTON MEDICAL AND SURGICAL SOCIETY:—President—Dr. G. W. Mylks. Secretary—Dr. W. R. Connell. Treasurer—Dr. H. E. Day.

LAMBTON COUNTY MEDICAL ASSOCIATION:—President—Dr. J. E. Kidd, Wyoming. Secretary-treasurer—Dr. A. R. McMillan, Sarnia.

LEEDS AND GRENVILLE MEDICAL SOCIETY:—President—Dr. J. C. Mitchell, Brockville. Secretary-treasurer—Dr. F. S. Vrooman, Brockville.

LONDON MEDICAL ASSOCIATION:—President—Dr. E. Spence. Secretary-treasurer—Dr. C. A. Harris.

LUNENBURG-QUEEN'S MEDICAL SOCIETY:—President—Dr. J. W. Smith, Liverpool. Secretary—Dr. L. T. W. Penney, Lunenburg.

MANITOBA MEDICAL ASSOCIATION:—President—Dr. James McKenty, Winnipeg. Secretary—Dr. A. T. Mathers, Winnipeg. Treasurer—Dr. T. Glen Hamilton, Winnipeg.

MEDICAL OFFICERS OF HEALTH FOR COUNTIES OF LINCOLN AND WELLAND:—President—Dr. King, St. Catharines. Secretary-treasurer—Dr. Howell, Welland.

MEDICAL SOCIETY OF NOVA SCOTIA:—President—Professor Fraser Harris, Halifax. Secretary-treasurer—Dr. J. R. Corston, Halifax.

MEDICINE HAT MEDICAL SOCIETY:—President—Dr. W. H. Macdonald. Vice-President—Dr. C. E. Smyth. Secretary-treasurer—Dr. J. S. Macleod.

MONTREAL MEDICO-CHIRURGICAL SOCIETY:—President—Dr. W. S. Morrow. Secretary—Dr. Grant Campbell.

MOOSE JAW MEDICAL SOCIETY:—President—Dr. J. M. Hourigan. Secretary-treasurer—Dr. J. Bloomer.

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Annual meeting, Saskatoon, July, 1917.

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PAST AND PRESENT

ADDRESS IN SURGERY

By Francis J. Shepherd, M.D., LL.D., F.R.C.S.

WHEN asked to deliver the address in surgery to the Canadian Medical Association, my first impulse was to refuse, for I had for some three years given up surgical practice and felt the task ought to be undertaken by some younger man in active work who was more *au courant* with the surgical problems of the day. However, I was overruled, and not wishing at this time of great patriotic endeavour to relegate the office to outsiders, I consented to do my best and address you to-day.

It has always been my opinion that our Canadian national societies should, at their annual meetings, take stock of the knowledge acquired in the special departments of science they represent, so that the papers read should be an index of the progress of that science the society is interested in. Now this applies to Medicine as well as to other departments of science and I contend that our meetings should not be made use of for strangers to display their knowledge and cleverness, and often to play to the gallery, but that we should rely on our own members for papers and contributions and so be an index of our own vitality. We are passing out of the colonial and dependent stage and are becoming one of the sister nations of the great empire of Great and Greater Britain.

In 1874–5, when I was in Vienna and filling up my papers for the *Politzei*, I wrote in "Dominion of Canada" as the country I hailed from, but so little was the country known at that time that my papers were returned with the query: "Was it not the Island of Candia I meant?" I said, "No, it was Canada," and it took

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Delivered before the Canadian Medical Association at the forty-eighth annual meeting, Montreal, June 15th, 1917.

three months before an investigation satisfied the authorities that there was such a country as Canada and I was given leave to reside in Vienna. Again, when in London as a student, placards were posted on the church doors by order of the Privy Council, stating that information had been received from Ontario, the *Capital of Canada*, that the potato bug had arrived and warning the people of England against its introduction into that country.

Now in the fiftieth year of the formation of our nation how different is the picture! Since the war began the name "Canadian" has quite a distinctive significance apart from "American". How often have Canadians and Americans been synonymous terms, even with our fellow subjects in Great Britain. But now since the deeds of our soldiers have been so illustrious on the battle fields of Flanders and France, all the world knows the "Canadians" and never again will we be confused with our neighbours across the line. Not only have the Canadian soldiers given us a distinctive place in the eyes of the world, but our Canadian hospitals and ambulances and Canadian surgeons and physicians in France by their splendid work have also written their names on the tablets of history and have become a separate entity. We are not now classified as Americans, but as Canadians. This is a very great advantage to all of us and will in future make us more self reliant and make us believe more in ourselves and tend to form a school of medicine of which we can all be proud, and teach us to draw less heavily on the knowledge furnished by others, not Canadians. Now in this connexion, why should we not have our Royal Colleges of Surgeons and Physicians affiliated with those of Great Britain which we respect and reverence so much. Why should we be dependent on the Americans for our titles as surgeons or physicians? Why should not we have F.R.C.S.&.P. of Canada after our names? Some years ago this Association nominated a committee to look into this matter, but like so many other committees it has never reported.

My view of surgery extends back for many years, to pre-antiseptic days, and I esteem it a great privilege that I saw the birth, growth, and triumph of the principles of antiseptic surgery. It has been a wonderful experience and no one who has not lived through this period can fully appreciate the vast changes and advantages it introduced to the great benefit of all mankind. The only analagous epoch-making discovery was that of anæsthesia. Pre-anæsthetic and anæsthetic times were comparable somewhat to pre-antiseptic and antiseptic times. In my student days the older surgeons were all of the pre-anæsthetic period and one was amazed at their dexterity and celerity in operating, for time was an object when they learned to operate. Of course the range of operations was limited to amputations, lithotomy (lateral), the removal of external tumours, the ligature of arteries, and occasionally the trephining of depressed fractures of the skull. Not only were these men most skilful and rapid operators but they were first-class practical anatomists and were never uncertain in the use of the knife: the timid and ignorant operator was eliminated by the conditions which then existed.

How different is the surgery of to-day; no cavity is free from the successful intrusion of the surgeon and many purely medical regions have been transferred to him entirely. What rapid strides surgery has made and how difficult it is for the ordinary man to keep abreast of its rapid progress! No one can now, as formerly, be efficient in the whole range of surgery, so there are many subdivisions and specialties. This does not always make for the broadening of the surgeon but it makes him perhaps more efficient in special lines. I see a large book has been published lately on the diseases of the umbilicus.

The advent of *x*-rays was another most important and epoch-making discovery, and how useful it has been in the present war!

This war has brought antiseptic as contrasted with aseptic surgery to its own again, and how much more efficient has the army medical service been as compared with previous wars, even though in this great Armageddon high explosive shells, liquid fire, and poisonous gas are used! How complete the arrangements for removing the wounded, getting them rapidly to operating centres, etc., etc. I have of late seen several cases of multiple wounds of the intestines from shrapnel returned to the military convalescent hospitals here in good health and able to do ordinary work. It is remarkable what comparatively good results have been obtained in the field of abdominal surgery. For a good many years it has been the custom of surgeons in civil hospitals to operate without delay in penetrating wounds of the abdomen, but until the present war gunshot wounds of the abdomen received in the field of battle were treated expectantly; now army surgeons are advocating, where possible, immediate operation. Dr. Abadie has published a book on this subject called "Les Blessures de l'Abdomen", and has collected 713 cases treated by expectant treatment with 77 per cent. of a mortality, and 688 cases treated by operation with a mortality of 64 per cent. He advocates early laparotomy in penetrating wounds of the abdomen and that operating facilities should be as close to the trenches as possible, suggesting operating rooms on wheels which can be moved easily. He prefers chloroform as an anæsthetic and for four or five days that nothing be given by the mouth, but that four or five litres of fluid should be passed daily into the bowels by the drop method. He also advises that the patent should be kept under the influence of morphia.

In the March 10th number of the *British Medical Journal* there is a series of articles by army surgeons on penetrating wounds of the abdomen which is well worth reading and from the satisfactory results obtained in apparently desperate cases they deserve to be congratulated for their good work. In stomach wounds without other injuries, more than half recover if early operation is possible. In cases of uncomplicated wounds of the small intestines, seen early, the recoveries are often 100 per cent.; in other wounds of the intestines, suitable for operation, 30 per cent. recovered. These statistics agree with Major Archibald's experience as described in an article in a recent number of the *Journal of the Canadian Medical Association.* Wounds of the large intestine are more fatal owing to the greater risk of infection. On the whole, however, the chances of recovery after wounds of the abdominal hollow viscera are better than in cases of compound fracture of the thigh.

This is certainly a most encouraging report and means a great advance in the treatment of gunshot wounds of the abdomen. I have seen several cases of multiple gunshot wounds of the intestines as I said before, returned here to our military convalescent hospitals, which have been operated on successfully close to the front, and this is a great step forward, and although not so life-saving as the prevention of typhoid, yet shows the wonderful progress of battlefield surgery.

A method of disinfecting wounds has been devised by Carrel in which Dakin's solution, the hypochlorite of sodium, is used. The object of Carrel's method of disinfection is, of course, to render a wound sterile so that the antiseptic used comes in contact with every part of the wound, and "that the antiseptic is maintained in suitable concentration throughout the entire wound and that this constant strength is maintained for a prolonged period. If these conditions are fulfilled every wound will show its response to the treatment by the diminution and disappearance of its microorganisms (Lyle). The wound should first be thoroughly disinfected and all shell fragments, clothing, dirt, etc., removed before the apparatus devised by Carrel is used, so as to keep up a continuous application of the antiseptic. In the wounds treated by this method there is no redness, tenderness or induration at the edges; they heal rapidly, and on schedule time—for flesh wounds fourteen days, compound fractures twenty-eight to thirty days. The necessity of amputation for infection is abolished and suppuration disappears. Many patients have quite supple scars and the gravity of severe mutilations is so much reduced that men are returned to the front who otherwise would be crippled for life.

So you see antiseptics are coming into their own again, although the old antiseptics have not proved entirely satisfactory in septic wounds produced in this present war; for there is so much destruction of tissue and such deep infection that ordinary antiseptics do not seem to be sufficient. Of course free incision and the removal of foreign bodies are of great help, but some chemical is needed to cleanse the wounds and destroy germs. Most antiseptics, such as phenol, alcohol, Dakin's solution, hydrogen peroxide, iodine, etc., etc., while killing the bacteria destroy the cells and so prepare a nidus for flesh infection. Browning and his co-workers, Gulbransen, Kennaway and Thornton,* of the Bland-Sutton Institute, have shown that bactericidal substances must have a great potency against all organisms in the presence of proteid materials such as serum; it must be stimulating to granulations; it should have no deleterious effect upon phagocytosis, no irritant action on delicate tissues, such as mucus membranes, and no toxic effect on the most highly specialized cells. They found that in all known antiseptics the bactericidal potency in watery solutions is diminished when the medium is wholly or partially serum. They also found that a number of acridine dyes have an enhanced bactericidal power in the presence of serum; the compound diamino-methyl-acridinium chloride, which the authors call "flavine", is the best; twenty times more powerful than corrosive sublimate, and eight hundred more so than carbolic acid or chloramine under the same conditions. The tryphenylmethane compounds, especially brilliant green and crystal violet, are very active as regards cocci, but towards B. coli their bactericidal value is considerably lower than flavine. Flavine is much less detrimental to the process of phagocytosis and less harmful to the tissues than other substances, hence a much higher concentration can be employed without harming the tissues or interfering with the natural defensive mechanism, and it is more rapid in its action.

**British Medical Journal*, January 20th, 1917.

Brilliant green comes next in efficiency in these respects. No doubt many other antiseptics will be evolved before this war is over, of more value than those we have placed such reliance on in the past, and often used blindly without knowing how well or efficiently they acted. However, the last word has not yet been said on antiseptics.

These are not the only problems the war is helping us to solve: there are many others, such as, how to cope with the terrible gas gangrene which is at times so prevalent; the cause of shock, which has puzzled us for so many years, and about which there is such a diversity of opinion as to its nature and prevention. In war surgery what is most dreaded is shock, for until it is overcome the surgeon cannot successfully operate. H. H. Dale and P. P. Laidlaw, of the British Medical Research Committee, have lately been investigating this subject.* By injecting a poison called histamine profound shock is produced, profound fall in blood pressure and a loss of about one half the plasma of the blood in five minutes. This is due to the passage into the tissues and lymph spaces of all the constituents of blood plasma—in fact a large part of the blood disappears, the veins are empty and the capillaries have lost their tone; although the heart beats fairly strongly there is no pulsation in the arteries. Many causes produce like effects, such as the toxæmia from gas gangrene, bacillary dysentery; there the fluid is lost by excretion. Similarly shock is produced by intestinal obstruction, post operative shock, without hæmorrhage, extensive burns, etc. As to treatment—prevention is advocated. Hæmorrhage predisposes to shock, also fatigue, exposure and starvation. It is also suggested that free saline purgation before operation and abstinence from food and water may also predispose. Free supply of fluid by infusion of saline into the rectum or subcutaneous tissues must be undertaken before operation. The only drug of any use is pituitary extract, for it causes a prolonged and general contraction of the arterioles and so diminishes the total capacity of the circulatory system with the effect that deficient blood pressure is diminished. Adrenalin, the effect of which is very transitory, is objected to and intravenous injection of hypertonic saline is advocated, as used in cholera. The paper, of which I have given such a short summary, is well worth reading and brings us another step forward in solving the problem of the nature and prevention of shock.

All praise for the great work the surgeons and physicians are doing at the front, and behind it! How self-sacrificing has been their work, and how many we know have given up their lives for the cause in the performance of their duty behind the firing line, attending the wounded and helping them at the risk of their own lives! Rewards are given to those who successfully escape the dreadful slaughter, but after all the best are often taken and where are their rewards? Merely in the memory of those they have left behind.

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*_British Medical Journal_, March 24th, 1917.

What good work the physicians have done in preventing typhoid, tetanus, etc.! The sanitary arrangements of all areas occupied by the British are almost perfect and the cleansing and drainage of villages occupied by them is wonderful to see.

On this side of the water we also have to do war work and those wounded and invalided soldiers who are weekly being sent over to us give us cause for much thought. Not only have large hospitals to be provided for them, but we have to act as foster-fathers to those soldiers who have become more or less incapacitated, and to endeavour by treatment to restore them as far as possible to normal conditions, and to reëducate them so that they may earn a living and not be a burden to the community. This the Military Hospitals Commission is doing as far as its opportunities and equipment enables it to do. Vocational training and reëducation will go on for some time after the war so that Canada will for some years be reminded of the great struggle by the presence among us of many of its victims.

Many strange things happen in this vocational training and reëducation; many have discovered that they have tendencies and predilections and ability for certain forms of work which were hitherto unknown to them. In one case a poorly educated French Canadian, who had been a plasterer, lost a leg and whilst attending the educational classes developed a wonderful talent for drafting and he is now employed in a large establishment as a draftsman at a very respectable salary. Carpenters have been developed, also mechanics, who previously had no notion of their tendency in that direction. Many who could read and write with difficulty have become proficient and others in addition have taken to arithmetic and book-keeping. Others, less intelligent, have been satisfied to learn to be time-keepers, etc.

The Military Hospitals Commission have established in Toronto an artificial leg factory where the lightest and best types of leg can be made and fitted; in consequence our legless soldiers are sent to Toronto to be properly fitted with artificial limbs and whilst there, and waiting, they are given vocational training in any branch of work they have an aptitude for, which work they can continue after their discharge. The government has provided that whilst discharged men are learning a trade their families are provided for until their work becomes remunerative.*

I see that in the early part of this year there was a great controversy in the *British Medical Journal* about the relationship between the surgeon and the physician; that the surgeon was overpaid in his mere mechanical or handicraft work, whilst the physician, who looked down on hand work, for the superior brain power put into his diagnosis and opinion, was very poorly paid. Sir Clifford Allbutt, in an interesting letter, points out that down to the 12th Century the physician and surgeon was combined in one person, instancing Hippocrates, the Great Alexandrians, Galen, and the great school of Bologna. In the next century the division between surgery and internal medicine became complete when the University of Paris excluded from its degree all who worked with their hands; then it was, as Burdon Sanderson said, that "Medicine lost its scientific arm". This example of Paris blighted other universities, such as Oxford, Cambridge, Montpelier, and Toulouse. As the writer of the letter says: "Thus medicine obliterated herself and dried into the husks which were mocked at by Petrarch, Rabelais and Molière." Even forty or fifty years ago, or later, no surgery or surgical certificates were required for the M.D. degree of Cambridge. It is absurd to separate entirely these two great branches of medicine and every surgeon ought to be somewhat of a physician and the physician somewhat of a surgeon; or at least know enough to call in a surgeon in time. As a rule surgeons and physicians work harmoniously together and should be like man and wife, each depending somewhat on the other and determined to bear and forebear. An old saw says:

A single doctor like a sculler plies,
The patient lingers and then slowly dies.
But two physicians like a pair of oars,
Shall waft him swiftly to the Stygian shores.

If there had been a surgeon and a physician in this consultation the result above referred to would probably not have happened.

Now as to the fees of surgeons. Many people think they are sometimes exorbitant and it seems to me that in some cases in the country to the south the surgeon has been out for spoil. Fees as large as $25,000 and more have been charged, basing the charge on the income of the patient. Now, I have always felt that this was commercializing the profession and that no operation was worth such an amount, a fair and reasonable fee up to $1,000 for the rich and a graduation downwards for those less able to pay seems to me fair, and I personally have no regrets in my past career as to excessive charges. I know of cases where the patient, or the husband, has had to sell household goods to pay the surgeon. Such things should not be and surgeons before long will have, if they have not already acquired it, the reputation of lawyers. A lawyer is described by Lord Brougham as, "A legal gentleman who rescues your estate from your enemies and keeps it for himself." I am well aware that many times the surgeon is underpaid, or not paid at all, but that is no excuse for the use of Robin Hood methods.

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*In the near future the Commission intend to establish other artificial limb factories in the other great centres for at present the Toronto establishment cannot keep up with the demand.

The multiplication of medical journals, good, bad, and indifferent, is another feature of development in the last forty years. Formerly nobody wrote unless they had something to say, but now every man is solicited to write and cannot apparently succeed without much advertising. Undigested articles see light, and crude theories are enunciated as truths. Work half done or badly done is reported for fear some one will get ahead of them. The consequence is there is a mass of purely ephemeral literature which does no good to anybody, except perhaps temporarily to the writer. A new remedy is discovered, everybody rushes into print and recites their experiences before the remedy has had time to be tested. Douglas Jerrold said once to a young man who burned to have himself in print: "Be advised by me young man, don't take down the shutters until there is something in the window." How many are those who have anything to show in the window after the shutters are taken down? "Oh that mine enemy would write a book," said the Psalmist. Now every medical man who is anybody does write a book, and although it may be condemned by a few, if well advertised it is read by the many. I heard a medical publisher say once that he did not care who wrote the book if he published it he could sell it, not on its merits but on his fulsome and oft repeated recommendation. The younger the practitioner as a rule the more he writes. Encyclopædias and systems are written or compiled by very young men having plenty of time, but as they get older they write less, but what they write is more worth reading, and by experience they learn how little they formerly knew, though posing as authorities. In time they become more critical of their own work and hence produce less. However, this premature work was not without benefit for the training they got and the amount they learned in preparing articles did them much good and prepared them for the riper work they produced later on.

Before closing this rather fragmentary address, I should like to say a few words on a subject about which I wrote many years ago, viz: Medical and Surgery quackery. A new phase has opened up during the past few years,—the desire on the part of the quacks to be legalized and the wish of many members of the various legislatures to aid them in this object. In Ontario, irregulars, such as osteopaths, chiropractors, etc., are trying to get an Act passed to legalize them and put them on a par with the regular profession and are finding support amongst supposedly educated and cultivated people. A commission, appointed over a year ago, has been investigating their claims and those of the regular profession, with no definite result as yet. That a commission was appointed shows the tendency of the times. It is extraordinary; notwithstanding all our education and supposed higher civilization, how quackery flourishes. In fact it is the upper classes of society who patronize quacks. "Imagination," says Bacon, "is next akin to a miracle working faith," for imaginary diseases are cured by the imagination. Man is a dupable animal; there is scarcely any one who may not, like a trout, be taken with tickling (Southey). The cures are mostly in those cases where no organic change exists, but that they have taught something I won't deny, for in cases of stiff joints with fibrous ankylosis or fibrous adhesions after traumatism, they often do good, but in many cases when serious lesions exist great harm can be done. I saw one case of ulcer of the stomach which had been rubbed for some time by an osteopath and who at last becoming alarmed at the condition of the patient sent him to a surgeon for operation. A perforation of the stomach was found and there was general peritonitis, accelerated, no doubt, by the vigorous treatment of the osteopath. The patient of course died. It is curious how now-a-days (although there have been bone-setters from time immemorial) that the modern quack treats mostly surgical cases; replaces a supposed bone out of place, reduces a dislocated spine, or rubs out a tumour—all more or less surgical. Now if such men are legalized, as they are in some states of the Union, then there is no further use for carrying on the work of various licensing bodies called colleges of physicians and surgeons. Let us have free trade in medicine and the best man will always come out on top. There is one notable instance where the bone-setter put the profession in the right way—the reduction of the dislocated hip by manipulation, which was practised for generations by a family living in one of the New England states. They transmitted the secret from father to son and Dr. H. R. Bigelow of Boston, hearing this, investigated and found that there was something in it and by a series of dissections of the hip joint proved that the resistance to reduction was caused by the tension of the ilio-femoral ligament and when this was relaxed by flexion and the limb rotated, the bone slipped into place. This much we are indebted to the bone-setter who accidentally found out this fact without knowing the reason. They have also taught us that the manipulation of joints after injury is better than the enforcement of rigidity, which was advised by the older surgeons.

There seems to be almost in every body a vein of superstition and credulity against which argument is useless and which education does not seem to eradicate. Perhaps what Oliver Wendell Homes said about these people is the best advice: "Ephraim is wedded to his idols, let him alone." Another has said many years ago: "The final, though distant extinction of quackery is to be hoped for, it forms a fragment of the final triumph of reason and virtue which is the secret consolation of every philanthropist."

THE Sixth Annual Congress of the Canadian Public Health Association will be held in Ottawa on September 27th and 28th, 1917. The meeting of the Canadian Association for the Prevention of Tuberculosis will also be held in Ottawa on September 26th, 1917.

THE MODERN CONCEPTION OF PUBLIC HEALTH ADMINISTRATION AND ITS NATIONAL IMPORTANCE

Bf Charles J. Hastings, L.R.C.P.I., M.D.

Medical Officer of Health, Toronto

THE most appalling feature of the present international struggle for the principles of civilization is the great sacrifice of human life—the sacrifice of the best of the man-power of all nations. Here I might ask and do ask—in what respect does this differ from the sacrifice of human life and human efficiency through preventable diseases? The Kaiser and Junkerdom have made God the author of this international struggle and have chosen Him as their junior partner. On the other hand, superstition, doctrinal delusion, and incredulity have for centuries been making God the author of disease, and have blamed Him for all the disastrous results of its ravages. However, the principles of the democracy for which we are fighting, which in this connexion means the general diffusion of knowledge, bringing it within the reach of the people, places the blame where it belongs. The democratizing of the knowledge we possess as regards the cause of disease and the ways and means by which it is transmitted, is sweeping aside these superstitions and doctrinal delusions, and is transferring the blame from Providence to our failure efficiently to apply the knowledge we now possess. Incidentally we are giving man a truer conception of God.

In the various nations engaged in this war, in times of peace, over 6,500,000 die annually from preventable diseases. There have been fewer than 7,000,000 killed in action on all sides since the outbreak of war. Obviously then, all the battles in the interest of humanity and the interests of nations are not fought on the firing line. The perennial warfare waged against the invisible foe is as important—if not more so—than that now waged against those who are threatening the destruction of the very principles of civilization.

Public Address in State Medicine, delivered at the forty-eighth annual meeting of the Canadian Medical Association, held in Montreal, June 13th, 14th and 15th, 1917.

Early History of Public Health Administration

In order properly to appreciate the advances in public health administration during the past decade, one requires to review briefly the history of preventive medicine. As far back as history carries us, and in fact, in prehistoric times, we find evidence of those in authority among the Egyptians, Greeks, and Romans having had some conception of the necessity for sanitary laws. One cannot run over the wonderful code of Hammurabi, king of Babylon, compiled 2,200 years before Christ, and which was unearthed in the Acropolis Mound at Susa in 1902, without feeling that he, too, had a full appreciation of the importance of hygiene. However, we have no record of these conceptions of the necessity for sanitation having been codified until Moses handed out his sanitary regulations about the beginning of the sixteenth century B.C. The three (3) cardinal principles of this sanitary code were—personal cleanliness, isolation of the sick, and the efficient safeguarding of the food supply. These sanitary laws were excellent and were, for the most part, well administered, especially as regards personal cleanliness and the care of the food. It is more than probable that the comparative immunity of the Hebrews from epidemic diseases and plagues, as compared with the early Christians, Greeks, and Romans, was, in a large measure, due to personal cleanliness. This was particularly true of the Pharisees, who, as a religious rite, carefully washed their hands before partaking of food, believing as they did, that the eating of food with unclean hands defiled a man. They also emphasized the importance of washing all cups, pots, and brazen vessels, tables, etc. These hygienic principles were religiously carried out. Medical health officers were appointed in Rome in 495 B.C. They were placed in charge of districts and the sanitary measures carried out under their supervision were, in many respects, commendable. Tradition tells us that the Cloaca Maxima was constructed under the direction of King Tarquinius Priscus, 616 to 578 B.C., and is still used in the drainage of Rome and receives many branches between the Capitoline, Palatine, and other Hills. It is formed of three consecutive layers of enormous stone, one above the other, in concentric rows. The inside measurement is, approximately, 13 feet square. These, with the aqueducts, three of which are still in use, are marvels of engineering skill. However, the superstition and doctrinal delusions of the early ages, that disease and pestilence were a direct visitation of Divine wrath, caused them to turn their attention from prevention and preventive measures to the building of hospitals, alms-houses, etc. It was this, no doubt, that Ruskin had in mind when he said that "any regulation which tends to improve the health of the masses is viewed by them as an unwarranted interference with their vested rights in inevitable disease and death." For these delusions they have surely paid the penalty in the early and middle ages, and even down to quite recent years, blaming Providence for diseases for which they, themselves, through ignorance, superstition, and incredulity, were responsible. It would be difficult to conceive of any greater reflection on our intelligence than retaining in our burial service, "The Lord giveth and the Lord taketh away." Is this not libelous on the Almighty? We are responsible in failing in our duty properly to apply the knowledge we possess of the cause of disease and how it is transmitted. For instance, Toronto's death rate from typhoid fever in 1910 was 40·8 per 100,000, and in 1915 it was reduced to 1·9. This was brought about for the most part by safeguarding our water and milk supply. Furthermore, since the organization of our division of infant and child hygiene, in 1914, our infant mortality has been reduced one third, that is, we had 676 fewer babies die than would have died, if the death rate previous to 1914 had continued. Toronto's general death rate in 1910, was 14 per 1,000—in 1915 it was 11 per 1,000, which meant a saving to the city of 1,102 lives. So that the Lord would have been blamed for these 1,102 that would have died, if Toronto had not adopted the necessary preventive measures. Let us place the blame where it belongs and remove many of the obstacles to efficient health administration.

It would seem as if David, king of Isreal, foresaw great possibilities in the sanitary laws of Moses. In the Psalms, of which he is credited with having written part, at least, he, with prophetic vision, must have been peering into the future of preventive medicine when he said: "Thou shalt not be afraid for the terror by night, nor for the destruction that wasteth at noonday, nor for the pestilence that walketh in darkness." One cannot but be impressed with the apparent conception that the writer must have had of the control of malaria and yellow fever, "the terror by night" (through the anopheles, and the stegomyia mosquito); the control of venereal diseases, "the pestilence that walketh in darkness;" and the control of the wasting diseases of middle life in "the destruction that wasteth at noonday". Malaria was comparatively common in Italy as early as the Second and Third Centuries and was probably brought over by the soldiers or the Carthagenian mercenaries during the Second and Third Punic Wars. At that time the Roman Empire aspired to extend to the most remote parts of the earth but disease and pestilence or plague reduced the population by one quarter to one half. The same was true of Greece, Athens, and other cities of Europe and Asia. It was, obviously, not the Gauls or Vandals that conquered Rome but the plague and malaria.

Rome had not realized that public health was a national problem and was the foundation on which rested the strength of the nation. It is interesting to note that, after the outbreak of the plague in different countries, in pratically every instance certain conditions were found to be present, such as an inferior quality and an insufficient quantity of food, filthy environments and decomposing animal and vegetable matter about the homes; in brief, there were associated with poverty and all that attends it, environments most favourable for rodents, vermin and insects.

Modern Conception of how Diseases are Transmitted

From the first outbreak of the plague down through the middle ages, and, in fact, until recent date, people were as unsuspicious of rats, ground squirrels, fleas, flies, or other animals or insects playing any rôle in the transmission of plague as they were of the anopheles mosquito playing any rôle in the transmission of malaria or the stegomyia mosquito in the transmission of yellow fever; or the body louse of typhus fever. In fact, it is only within recent years that we can boast of this knowledge. Without any knowledge whatever of bacteriology, administrators of public health were floundering without rudder or compass. The abating of nuisances, the disposal of sewage, the draining of the homes and the more or less effective quarantine of communicable diseases constituted the activities of public health administration.

The Germ Theory and Germ Origin of Disease

The germ theory of disease dates back at least to the Second Century, though it is only a few decades since this theory became a fact. There is every reason to believe that Aristotle was convinced that there were microörganisms that were responsible for disease. However, many years have passed, during which we have no record of any valuable research work having been done or any important observations made in regard to the germ origin of disease, until 1843, when the late Dr. Oliver Wendell Holmes, whose memory we are all delighted to honour, having convinced himself of the transmissibility of the so-called puerperal fever, wrote and published a monograph on this subject, which, in itself, was sufficient to have immortalized his name. Three years after this, in 1846, Semmelwisse a young Hungarian from Budapest, being in charge of the Lying-In Hospital at Vienna, as a consequence of keen observation, was convinced that the so-called puerperal or childbed fever was transmitted to the patients in the lying-in wards of the hospital by the doctors who were engaged in pathological work in the dissecting room. This was probably the first evidence we had of this being a wound infection. In 1849, in a small town on the Rhine, a physician, named Pollenger, became interested in examining the blood of human beings and animals, both in health and disease. In examining the blood of cows suffering from anthrax, he discovered small, rod like bodies, which did not appear in the blood of healthy animals. This so interested him that he made a large number of examinations and repeatedly found these rod like bodies present in the blood of the animals suffering from this disease, therefore became convinced that there was some connexion between the two. He presented his findings, in the form of a paper or an address, to the medical societies, setting forth in detail the work that he had done, the observations made and the conclusions arrived at. This was subsequently published in the *Medical Journal* but there is no evidence of it having given any special concern to his colleagues. Later on, this work was taken up by Devaine, who went a little further than his predecessor and inoculated animals with the blood taken from those suffering from anthrax, with the result that they practically all contracted the disease. This research was subsequently pursued by Koch, Pasteur and others.

THE IMMORTAL PASTEUR

To Pasteur, more than any other, are administrators of public health indebted for having so efficiently blazed the trail for scientific public health administration. As Elliott of Harvard expressed it, referring to the extension of Pasteur's work into biology: "The career of Pasteur illustrates admirably the passing of the scene of beneficient scientific research from chemistry and physics to biology."

Pasteur was not long pursuing the study of biology before he was convinced of its wonderful possibilities, as is well expressed in the following extract from his own pen: "What would be most desirable would be to push these studies far enough to prepare the road for serious research in the origin of the various diseases." It is, therefore, quite apparent that Pasteur had quickly grasped the importance of this science which has been demonstrated to be the most serviceable of all the sciences to mankind. One can have some conception of the keen sense of responsibility of this man from the following extract from a letter written by him to his father over half a century ago: "God grant that by my persevering labours I may bring a little stone to the frail and ill assured edifice of our knowledge of these deep mysteries of life and death, where all our intellects have so lamentably failed."

What Biology has done for Preventive Medicine

It was not until 1866 that this knowledge of the germ origin of wound infection was turned to practical account by Lord Lister in his principles of antiseptic surgery, and it was not until ten years after this again that these principles were fully accepted, the religious carrying out of which is alleged to have saved more lives than were sacrificed in all the wars of the Nineteenth Century. Following this, discoveries have been made from year to year and the individual organisms responsible for different diseases have been isolated; thus, preventive medicine has been placed on a definite scientific basis. Having been placed in possession of this knowledge, it was then given to us to determine the various ways and means by which these organisms were transmitted from one to another and to decide on the best means of control. Through the science of biology we have acquired an accurate knowledge, not only of the germs responsible for many of the diseases, but also of their haunts and habits. Through this science of biology in its broader sense, we know that the so-called criminal—whether a burglar, a murderer, a forger, or a prostitute—is, for the most part, suffering from a mind diseased, and therefore should be cared for in hospitals rather than in courts and prisons. This is true of probably two-thirds of the prostitutes in all large cities, who are in a degree mentally defective girls and who have, to a large extent, been "more sinned against than sinning". This is preventable by segregation or sterilization. While mental defectives cannot be cured, yet their reproduction can be prevented.

It is interesting to note in this connexion that one, who was neither a physician nor a biologist, but a statesman with vision, talking over the heads of his colleagues in the British House of Commons nearly three quarters of a century ago, said: "Public health is the foundation upon which rests the happiness of the people and the strength of the nation. Take the most beautiful kingdom, give it intelligent and industrious citizens, progressive manufactories, productive agriculture, let Arts flourish, let architects cover the land with palaces and mansions and, to preserve all these, maintain an indomitable army and navy, but, if the population of that country remains stationary, if it decreases physically and mentally, that nation must fall. This is why I say that the first duty of a statesman is the care of the public health." (Benjamin D'Israeli.)

EDUCATION THE MOST POTENT FACTOR

In the first place we must sweep aside the fallacies of the, past. We must unteach much that has been taught; for instance, the abating of nuisances and the general cleaning up of a city, plumbing inspection, the collection and disposal of garbage, etc., are no longer recognized by modern departments of health as activities essential to their departments. That all this should be done in every self-respecting community, no one will question, but what we do question is whether or not they play any direct rôle in the safeguarding of human life. They constitute, rather, the ascetic side of public health work and are rarely, if ever, responsible for the transmission of disease. Offensive odours do not produce disease, but decomposing animal and vegetable matter, through affording a breeding place for flies, may constitute a condition prejudicial to public health and should, therefore, not be tolerated in any municipality.

We must concentrate on the real, preventive medicine problems. We must so enlighten the public as to the control of these diseases that they will demand that, if they are preventable, they be prevented. This done, our problem for securing the necessary sinews of war is practically solved. Obviously, then, education is a pre-requisite to efficient public health administration. We have known for the past twenty-five years or more that certain diseases are due to specific germs and that all diseases are due to some infective agency. However, it is only within the past ten or fifteen years that we have had a proper conception of the haunts and habits of these various disease-producing germs and the ways and means by which they are transmitted from one person to another. We know that these diseases are transmitted, for the most part, by personal contact and indirectly through food and drink and eating and drinking utensils which have been contaminated by contact with infected people. Here we must ever keep in mind the mild cases, the unrecognized and unreported cases and the carriers. The two most common channels by which this transmission takes place are our water supply and our milk supply. The water supply of any municipality can be made safe by filtration and chlorination, and the milk supply of any municipality can be secured clean by means of a well organized system of dairy farm and dairy inspection, with proper regulations, rigidly enforced, but clean milk does not by any means mean safe milk. The only way by which clean milk can be made safe is by scientific pasteurization. By scientific pasteurization we mean the raising of the milk to a temperature of 145° and maintaining it at that for twenty-five to thirty minutes, then immediately cooling and keeping it at a temperature of not more than 40° until it reaches the consumer. This will destroy all disease producing germs and will not in any way affect the nutritive value, chemical composition or digestibility of the milk. Inasmuch as it is possible for any municipality to carry out this system of safeguarding their water supply and their milk supply, I unhesitatingly say that any community failing to do this is guilty of criminal negligence. Death from typhoid fever or tuberculosis is practically murder or suicide.

Next in importance is the efficient supervision and control of our restaurants, dining-halls and all places where food is handled and served for human consumption. All employees should be required to supply a certificate of health every six months, stating that they are free from any communicable disease and have not been associated with it for the previous two months. All eating and drinking utensils should be efficiently sterilized. The windows and doors of all restaurants and dining-halls should be screened so as to exclude flies. However, we cannot hope for full coöperation from the public until they are told why.

THE PUBLIC MUST BE EDUCATED

We are, fortunately, living in an age when people no longer wish to be treated as machines. It is obviously imperative, then, that the knowledge of the ways and means by which disease germs gain access to our bodies—which has, for the most part, been kept within the precincts of our Universities and laboratories—be democratized, that it be translated into language which can be understood by the man on the street and the woman in the humblest home in our city. They must be taught that the principles of antisepsis, which have done so much to control the transmission of septic infection in surgery, are the most efficient means by which we can control the spread of communicable disease. The question arises, then, how can this education be best accomplished? How can we get this information across to the people? Many opinions have been expressed and excellent plans for educational campaigns have been suggested but we have to bear in mind that every one has to be educated, that we must reach every man, woman, and child in the nation and that we have to deal with all degrees of intellect, from the president or chancellors of our universities to emigrants who cannot read. Obviously, then, there is use for our public health bulletins, for our press notices, for our leaflets, and for our different addresses, but the thousands who cannot read and the still greater number who do not read or do not think when they do read, and consequently require this education most, can only be efficiently educated by personal contact through heart-to-heart talks in the home, which can best be accomplished by the public health nurses who are visiting the homes. The personal touch and the personal services rendered by these nurses have given them a opportunity to establish confidence in the homes, which is a prerequisite to all instructions. However, this education should begin in the schools. It should constitute a part of the curriculum of every public and parochial school. There should be health catechisms for the kindergarten and there should be proper textbooks for the higher classes. These should be reinforced by a series of talks on the various phases of public health administration by the representatives of the department of public health, and the present course of hygiene which constitutes part of the curriculum in medicine, should be extended to Theology, Law, Arts, and the Sciences, but, while this is being done in the schools and universities, we must educate the present generation in the homes. The most outstanding example we have of the possibility of efficient education in this way is that in connexion with the control of tuberculosis. The nurses attend the tuberculosis clinics and follow the patients to the home, instruct the people in the home as to the danger of contracting this disease, the danger of the spreading of it, how this danger can be eliminated and how the one afflicted can be given the best chances for recovery and, incidentally, while visiting the home they ascertain the social conditions, as to whether or not the revenue of the home is sufficient to supply proper and sufficient food, not only for the patients but for the other members of the family, in order that their resisting powers be properly maintained. The nurse sees to it that the contact cases in that home are taken to the clinic for examination, in order that they may have detected the earliest possible invasion of the disease and thereby receive treatment at a stage when treatment is likely to be followed by success. The instructions given by the nurse in the home in regard to tuberculosis are more or less applicable to all other communicable diseases.

Additional Public Health Activities

However, when we have controlled communicable diseases, we have only accomplished a fraction of our work, inasmuch as there are many diseases that are not communicable, that are preventable or are postponable. For instance, the non-communicable diseases of infancy and childhood which are responsible in a large measure for our still unduly large infant mortality. There has probably been no other problem engaging the attention of progressive departments of health for the past five years at least, to a greater degree than that of our ever increasing infant mortality during the hot summer months. This has been the topic of earnest discussions in pediatric societies, congresses on child hygiene, and departments of public health, and yet the problem is not efficiently solved. There are, however, outstanding features upon which there is a concensus of opinion. These are—poverty, ignorance, and breast feeding—poverty with all its accessories coupled with an absolute lack of knowledge as regards the best means of safeguarding and developing the offspring properly, unitedly deal out their dreadful influence before and after birth. These observations have not been limited to recent years as evidenced from the following quotation from Shakespeare:

> "Famine is in thy cheek,
> Need and Oppression stareth in thine eyes,
> Contempt and Beggary hang upon thy back.
> The World is not thy friend, nor the World's law."

What a demonstration of man's inhumanity to man and this has been continued and handed down through the generations. However, the departments of public health, through their divisions of infant and child hygiene are bending their efforts against these foes, by educating the mothers and endeavouring to improve social conditions. If the expectant mother suffers from want, the developing offspring, wholly dependant upon the mother, is likely to be handicapped as a consequence when ushered into the world. Hence, logically, the care of the infant begins during the pregnancy of the mother, or the pre-natal period. Therefore, the general instructions of the expectant mother, both social and hygienic, to protect her against want and to improve her surrroundings, is the first requisite. This is apparent when we realize that more than one third of the infants that die in the first year, die during the first month, and from 60 per cent. to 70 per cent. of these die within the first week, when death is therefore due to pre-natal causes. Consequently, if these lives are to be saved, it must be by more efficient pre-natal care. If we would save the baby, we must save and protect the baby's best friend—the mother. There is no other resource that the infant has, or can appeal to, comparable to the maternal instinct. With no language but the cry, the infant when in distress promptly appeals in this way, which appeal none but the mother can properly interpret. It is a well recognized fact that the infant nursed at its mother's breast has ten chances for life and efficient development to one that the artificially fed child has. Consequently, our pre-natal care must embrace not only efficient piloting of the mother through her pregnancy and confinement, but we must also see that as far as lies in our power, we make it possible for her to nurse her baby. An absolutely safe milk supply for the entire municipality is the prerequisite in an organization of infant and child welfare. This secured, the organization of well baby clinics and milk depots come next in order. The babies are examined at regular intervals by competent pediatricians as regards their weight and general physical development, and instructions given in regard to feeding, clothing, etc., by both physicians and nurses, public health nurses following the cases, when necessary, to the homes in order to see that the doctor's instructions are carried out. Our physicians and nurses are endeavouring to make it possible for mothers to nurse their babies by instruction, reinforcing the revenue of the home and proper and sufficient nourishment. The entrance of women into industrial pursuits has at times made this more difficult. However, nations are beginning to recognize their obligations and some are leading the way. For instance, New Zealand, which has probably the smallest infant mortality of any country in the world—has accomplished this by nursing premiums. The mothers are allowed $50.00 by the government for nursing their babies. It has well been said by early writers, that for the infant, "All blessings flow from the maternal fount provided by Nature," and inseparably linked up with the care of the infant is the care of the child in the pre-school age. This is the period in which, unfortunately, the children in most municipalities have been sadly neglected until they enter school, when through a properly organized system of health supervision in the schools, they are cared for. It has been repeatedly observed that a large number of children, even though healthy in all respects at birth, become within the first five or six years, physically defective, with the consequence that municipalities through their boards of education and departments of health, are required, at no small cost, to restore these children, as far as possible, to their original state of health, to say nothing of the injustice to the child. This is not good government. The care of the child in the pre-school age should constitute a part and parcel of the duties of the organization of infant and child welfare, in all departments of health. This, when linked up with the medical supervision in the school, secures for the child the development of the best, physical as well as mental, of which it is capable, and to which every child is justly entitled.

The Influence of Industrial Diseases

Another lamentably neglected branch of preventive medicine is that of industrial diseases and industrial hygiene. Inasmuch as industrial diseases are, for the most part, preventable and industrial hygiene is essentially a part of a community hygiene, it must, obviously, come under the regime of the department of public health and the local board of health of every municipality. The term, "industrial diseases," embraces, first, the results of general insanitary conditions in factories, workshops, workhouses, and warerooms, badly lighted, overheated, improperly ventilated, ofttimes containing a dust laden atmosphere and improperly controlled heat and humidity, all of which, with the influence of fatigue, etc., tend to lower the vitality and, therefore, also the resisting powers of the body. The individual is thereby rendered an easy prey to infection which he may be daily exposed to in consequence of close contact with possibly a tubercular person or one convalescing from some communicable disease, or a chronic carrier. On the other hand, such environments only hasten on the fatal issues of these unfortunates, who are already the victims of some of the aforesaid diseases, who, through ignorance of their conditions or the dangers of their environments or through dint of circumstances, are compelled to face the inevitable.

Then we have the morbid state, consequent upon the occupation of trade, giving rise to specific disease, such as lead poisoning, arsenic poisoning, phosphorous poisoning, mercury poisoning, poisoning by fumes of mineral and other acids, wood alcohol, etc. It matters not whether a man dies from smallpox, typhoid fever, tuberculosis, lead poisoning, mercurial poisoning, or cancer, or from one of the degenerative diseases of middle life, it means a human life lost that might have been saved, The loss to the community, to the home, and to the nation is just the same; consequently, the control or postponement of these is essentially a part of the duties of departments of public health.

Degenerative Diseases of Middle Life

Then we have the degenerative diseases of middle life, another activity that has been lamentably overlooked by departments of public health. While we have been able to reduce materially the mortality from the more acute, communicable diseases, we are confronted with the appalling fact that in the past thirty years the death rate from degenerative diseases of the heart, arteries, and kidneys has increased 100 per cent. on this continent. This is not the case, however, in England, Sweden, and other European countries. In a group of apparently normal, commercial employees of an average age of thirty years, examined by the Life Extension Institute in New York City, 36 per cent. gave evidence of disease or disorder of the kidneys, 20 per cent. had abnormal blood pressure and 13 per cent. had hardened arteries. No intelligent community or nation can afford long to disregard these degenerative diseases and their economic loss, occurring, as they do, at the period in which life is most valuable and in its most productive period. The longer old age is postponed, the more time there is to provide for it. As Metchnikoff wisely pointed out, one result of lengthening life will be a greater utilization of the accumulated experience of years. We shall have less immaturity of judgement. The principle which leads to the choice for members of the judiciary of men of ripe years and knowledge will apply to every field of human activity, even in those fields which are now preëmpted by young men because of the necessity of utilizing their vitality. This will give to society a body of men with mature judgement of advanced years, yet healthy and fit, whose opinion and worth, in consequence of mature experience, cannot be over estimated. Our disregard for middle life and the degenerative diseases of middle life, and our insane methods of living, have very materially shortened the natural limitations of human existence. The Flourens' law that a mammal should live five times its growing period would, for the most part, hold good for our lives and the lives of all mammals if they were normal, and inasmuch as man is not fully matured until thirty years of age, this would place the length of his normal life at from one hundred and twenty-five to one hundred and fifty years. There are authentic cases on this continent of men and women reaching the age of one hundred and ten to one hundred and twenty. Metchnikoff maintained that the average old age should not at the present time be less than eighty-three years. If a business man were to look after his business in the slipshod sort of way that men look after their health, how long would that business live? Let us be sane then and be examined every six to twelve months. Pay your physicians for keeping you well and not for trying to cure one of these degenerative diseases, which come on so insidiously that they are incurable before discovered. We must remember that these diseases have no symptoms that can be detected by the patient until they are far advanced. Professor Irving Fisher, of Yale University, gave a full report of the examination of 2,000 employees, young men and young women, in different occupations in New York City: 13·10 per cent. had hardening of the arteries, 25·8 per cent. had abnormal blood pressure and 25·3 per cent. gave evidence of some kidney or liver trouble. Impairment was sufficiently important in 59 per cent. of the total number for the examiner to refer them to their own family physicians. These could all be postponed for from ten to fifteen years. Intemperance in eating and drinking, insufficient exercise, worry, the strenuous life, the mad rush for the almighty dollar—all interfere with metabolism resulting in auto-infection or auto-intoxication, and are therefore the great curative factors—these are preventable, why not prevent?

VENEREAL DISEASES—A PUBLIC HEALTH PROBLEM

In our failure to grapple with the problems of venereal diseases as communicable and preventable diseases, we are confronted by another unpardonable neglect of our duties. It is the opinion of those who are in a position to judge that venereal diseases constitute the most important of all factors in the degeneration and depopulation of the world. The innocent and the guilty, the intelligent and the ignorant, are paying the penalty of an ill-considered, false modesty in terms of morbidity and mortality that probably surpasses the amount of all other communicable diseases combined. The enormous medical, social, and economic significance of venereal diseases, which are largely the result of prostitution, has never been properly appreciated by any nation. Administrators of public health can, therefore, no longer afford to disregard these diseases as an essential part of their efficient administration.

HEALTH INSURANCE—A PUBLIC HEALTH PROBLEM

There are few problems affecting the ever increasing responsibilities of public health administrators receiving more serious consideration, and deservedly so, than that of health insurance. While much is being done by modern departments of health to make amends for the failures of the past, yet much remains to be done, and we see a valuable ally in health insurance—its relation to public health is manifest. Pioneer work on this problem has been done by European nations and a bill for compelling health insurance to cover all forms of sickness and mishaps not covered by workmen's compensation is now before five or six state legislatures and is being agitated by other states. Sickness and poverty go hand in hand, the one ever producing the other, and both are ofttimes closely allied to vice and crime.

If we would have a sturdy, thrifty race, we must make it possible for them thus to develop. We have, in health insurance, an ally that points the way—a co-partnership of the employer, employee and the government.

When the Right Hon. David Lloyd George, the most outstanding character in Great Britain to-day, presented his Bill for health insurance, or, as he styled it, "Sickness Insurance," or "The People's Insurance," to the British House of Commons five years ago, among the different reasons presented by him for the Bill was one based on a statement in the House by the Right Hon. John Burns, president of the Local Government Board, that 30 per cent. of pauperism in Great Britain is attributable to sickness. On the other hand, however, it must be borne in mind that a large per centage of sickness is due to poverty. Nations are realizing more and more every year the fact that the health of the wage-earning population depends, in a large measure, upon economic conditions.

What does this economic loss mean to the 2,400,000 wage earners of Canada? According to valuable data to hand, which is based on an investigation into between 25,000,000 and 30,000,000 industrial workers in different nations in Europe and different states in the Union, the average loss of time through sickness of wage earners is nine days per year. Estimating this loss at an average of $2.00 per day and an additional cost of $1.00 for medical attendance, means for 2,400,000 wage earners of our Dominion an economic loss of over $64,800,000 per year.

A government system of health insurance can be adapted to this country, and when adapted, will prove to be a health measure of extraordinary value. The fact that under such a system the employees have such a large measure of ownership and control, will remove all elements of paternalism. The employees will then regard the benefits as rights, not charities. Adequate medical relief will be placed within the reach of even the lowest paid worker and provide for him and his family during sickness. It will give to those responsible for conditions causing sickness a financial incentive to prevent disease. Its administration must be closely coördinated with public health agencies if it is to attain the greatest degree of success as a preventive measure.

In estimating the economic loss of the wage earners of this Dominion, no attempt has been made to estimate the loss of life, funeral expenses, or loss through partial permanent disability, consequent upon certain forms of sickness, or of the sorrow and anguish.

Furthermore, no attempt has been made to estimate the loss to the employer through physical unfitness of his employees. The conditions which give rise to the expressions—"I am out of sorts," "I don't feel fit," mean a loss of efficiency of at least from 5 to 10 per cent. Employers of labour can no longer afford to disregard such problems.

It must be apparent, therefore, that no farther reaching public health measure has ever been brought to our attention, for under its provisions it will be in the interests of both employer and employee to use all preventive measures to ward off disease since all are contributors to the insurance fund. Better health means higher efficiency. It is estimated by the public health service of the United States that 35 per cent. of the average earners of this continent must ask for public or private charity when disabled by disease. The average wage earner cannot afford to carry health insurance and when laid up is cast on the state or municipality for treatment, so that ultimately the government or the municipality has to pay the bills.

The Monetary Side of Public Health Administration

At the end of 1915 the Department of Public Health in Toronto endeavoured to ascertain what the monetary value of public health work really was, in view of the fact that, with those who have not made a study of the various problems and have not attempted to place any monetary value on human life, the expenditure of departments of public health are not infrequently questioned and the appropriation given for the safeguarding of human life, and the prevention of sickness, is, consequently, only too often far below what it should be. It was found in this investigation that the number of deaths that would have occurred in 1915, had the same death rate continued that existed in 1910, would have been 1,102 in excess of what it really was. In other words, the reduction in our death rate from 1910 to 1915 meant that in the latter year we had 1,102 fewer deaths than we would otherwise have had.

ESTIMATED VALUE OF PUBLIC HEALTH ADMINISTRATION

In making this estimate of the saving through the efforts of the department, different items have been taken into consideration. In the first place, the general death rate in 1910 for Toronto was 14. Therefore, the number of deaths that would have occurred in 1915 from all causes, if the 1910 death rate had continued, would have been 6,650 but, as a result of the lowering of the death rate, the actual number of deaths that did occur was 5,548. Therefore, the number of lives saved in 1915 as compared with 1910 was 1,102. The actual monetary saving of the municipality, as the result of the saving of these 1,102 lives, we have computed as follows:

Average value per life, as determined by Prof. Farr, of England; and Prof. Irving Fisher, of Yale University (all causes and ages considered), is	$1,700
Therefore the total savings in capitalized value of these lives was	1,873,400
Cases of sickness prevented (estimated as 15 for every death) meant a saving of	16,530
Months of sickness prevented (three quarters)	12,397
Cost of attendance saved	185,955
Loss of earnings prevented	309,925
The total saving effected for 1915 was found to be	2,391,320

The number of tax payers in Toronto is approximately 162,000. The increase in expenditure on public health as compared with 1910, was $216,328, or $1.34 per tax payer. The savings obtained by this increased expenditure of $1.34 per tax payer is at least $1,760,125, or $10.86 per tax payer, which means an annual profit upon the entire investment of $9.52 per tax payer.

In this estimate, no account is taken of the minor ailments—such conditions as cause a man to say that he's "out of sorts", "on the rocks," or "unfit". Such conditions, it is estimated, decrease the efficiency of that man's work from 5 per cent. to 10 per cent. and most of these conditions can be prevented by proper methods of living. It has been determined by educational associations in the United States that from 20 per cent. to 25 per cent. of efficiency in teachers and pupils is lost through improper ventilation.

Furthermore, no attempt has been made to estimate what these 1,102 lives saved would have meant in sorrow, in anguish, in 1,102 homes in Toronto. This cannot be estimated. Only those who have passed through it can have any conception of what it means.

Nor does this take into consideration the saving effected by well-organized divisions of industrial hygiene as well as other activities along the lines of preventive medicine.

Investment in a Baby

How many parents have stopped to estimate how much money they have invested in every one of their babies by the time it is a year old and by the time it enters school? Let us roughly estimate how much the average ratepayer has invested in his baby. In the first place, his doctor's bill will be at least $10.00 and ranging from that to $100.00. In the interests of economy, he will, no doubt, employ a nurse for about two weeks, for, say, $10.00 a week and board, which would mean, conservatively estimated, $25.00. The mother's time and attention for at least three months before and nine months after birth—all of this time she could have been earning at least $1.25 a day, which, no doubt, she would, at the most conservative estimate, have been earning if she had not been raising children. This would mean approximately $375.00, so that at the end of the first year he has an investment of at least $400.00 and, in the event of any reasonable prolonged sickness and death, probably another $100.00 expense would be added—to say nothing of the sorrow and anguish, which could not be estimated in dollars and cents. And, by the time the child is ready to leave the public school, he has invested in it over $2,000.00 and by the time he is twenty-one, there will be an investment of $5,000.00 and, if he takes a university course, an investment of from $12,000.00 to $15,000.00.

This only represents the monetary investment of the parents alone. To this must be added the national value, which is not inconsiderable. We must recognize that these babies born in Canada are, for the most part, of the man timber that our men are made of who are distinguishing themselves for deeds of bravery and for endurance in France and Flanders and, in fact, all along the line, any one of which is probably a more valuable national asset than two or three of the immigrants who will be coming within our gates.

What is being done to safeguard this great investment? If the same investment were made in Holstein calves, there would be no question about the government's activity. However, it is gratifying to know that, since the establishment of the division of infant and child hygiene in connexion with the Department of Public Health in Toronto, two and one-half years ago, our infant mortality has been reduced over 30 per cent. In other words, practically one third of the dangers of the child dying within his first year have been removed. If we go back to 1910, we find that our infant mortality was 139 per 1,000 babies born. In 1916, it was 91·5 per 1,000 births. In other words, 676 fewer babies died last year than would have died if the infant death rate of 1910 had continued. This 676 represents $270,400 of an investment saved to the parents alone—to say nothing of the nation, to which every well born infant should mean at least $1,000.00. Last year there were born in Toronto 14,796 babies. This by the time they are one year old, represents an investment of $5,918.400. The amount expended in the division of child hygiene and for the safeguarding of all these little lives and this enormous investment is approximately 12½ cents per capita to the citizens of Toronto, and this represents only one of the activities of Toronto's Department of Health in safeguarding human life. And, furthermore, it represents only the monetary side, to which, with statesmen at the helm, it should not be necessary even to refer. It does not take into account what those 676 babies saved have meant in the saving of sorrow and anguish; it does not represent the fact that there were 676 fewer sorrowing mothers leaning over little white caskets in the city of Toronto alone in one year. Would this phase of the work alone not more than warrant the expenditure that is asked for the administration of the entire Department?

From the foregoing, it must be apparent that appropriation for public health administration is not an expenditure, but an investment, yielding larger dividends, many times over, than any other municipal expenditure.

Conclusion

Obviously then, modern public health administration, to be efficient, must embrace all that goes to make for race betterment, for nation building—it matters not whether the man dies of typhoid fever, lead poisoning, mercurial poisoning, syphilis, or premature hardening of the arteries—the loss to the family and to the nation is just the same, and equally preventable. The efficiency of the people, the brains and brawn of the men and women that make up the nation, determine the strength and efficiency of that nation, whether in peace or in war, Consequently, the problems embraced in public health administration are federal—provincial and municipal. These are problems that governments must reckon with and that must take precedence to all others. Nations have long since recognized their responsibility to educate their children and have made this compulsory under the Truancy Act, and advisedly so, but for the most part have failed to recognize the obligation to safeguard the lives and health of these children and thereby secure their physical fitness. Every child has a right to be well-born and then is entitled to the development of the best, mental and physical, of which it is capable. The safeguarding and developing of the physical is even more essentially a national problem than the development of the mental, and its neglect in any nation is an economic error of inestimable magnitude. This country is spending over one million annually to educate children who die from preventable diseases before they reach the age at which they could make any return to the government for the money that has been expended on their education. This is not good government, nor is it nation building.

A DONATION of one hundred thousand dollars was forwarded a short time ago to His Majesty the King by Major W. Napier Keefer, M.D., of Toronto, late I.M.S., to be put to whatever use His Majesty might deem most suitable. The money has been allocated in the following way: two thousand pounds to the Star and Garter Home for Paralyzed Soldiers; two thousand pounds to the Nurse Cavell Homes; one thousand pounds to the Auxiliary Officers' Consumption Hospital; five hundred pounds to the Prisoners' War Fund; two thousand pounds for orthopædic treatment; and two thousand pounds for the treatment of deaf soldiers. Major Keefer entered the I.M.S. on October 1st, 1869, and retired on December 18th, 1889. He was for many years medical officer of the 13th Bengal Lancers, and afterwards chief medical officer of the Andaman Islands. He served with distinction in several campaigns in India and in Egypt.

A STUDY OF CERTAIN PSYCHOGENETIC CONDITIONS AMONG SOLDIERS*

By Colin Kerr Russel, Major, C.A.M.C.

Physician in Charge of Granville Canadian Special Hospital, Ramsgate

I AM using the term "Psychogenetic conditions" to include those cases of disability which have, as the main symptoms, motor and often sensory disturbances, and which, on thorough examintion of the nervous and locomotor systems, show no corresponding signs of organic disease, and which the subsequent history shows to be of a purely mental origin.

These cases may be divided into two main groups:

1st. What we would in civil practice diagnose as hysteria.

2nd. Malingering.

It is these two conditions which I wish to discuss. It is rather interesting to me to compare my experience in a general hospital in France with my experience in this hospital in England. One or two facts seem to me to stand out most prominently:

1. In France we never saw hysterical manifestations in a man who had received a shell or bullet wound.

2. In France, at the time of the Loos affair, during the shooting season one saw numerous cases of men who were brought in apparently deaf and dumb or blind, who lay in bed evidently in a state of nervous exhaustion—possibly throwing the head or limbs from side to side—who would apparently pay no attention to any one speaking to them, but one saw very few cases of psychogenetic paralysis of limbs and, in every case I did see, I was forced after careful observation and study to come to the diagnosis of malingering rather than that of hysteria.

For example: One man was admitted to my ward with all the outward and visible signs of a right hemiplegia of a severe type. The history of the onset was suggestive. After a foot bath parade, when lined up, the order was given, "Right turn."

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*The first four pages of this paper have already appeared in the issue for October, 1916. Since then the complete article has come into our hands and is published here as a whole on account of the interest of the subject.

He could not right turn so he had to left about turn. Just previous to this he had had pain in the right shoulder. He was very soon made to understand that his trouble was not of an organic nature and, in a confidential interview, he gave me the following story:

He was a regular in the Imperial Army and his time, seven years, would be up in one month. Since joining the army he had married and now had three children. He wished to leave the army at the expiration of his time. In spite of my explanation that that would be impossible, as he would naturally go on the reserve list and the reserve had been called out, he maintained that it was quite possible—perhaps later he would join the Army Service Corps—and so on. His method of getting out of the Army seemed obvious.

I also saw quite a number of cases of convulsive seizures, some of course, genuine idiopathic epilepsy, but others definitely psychogenetic, and it was in the consideration of these cases that I first came to the conclusion that there was a very close association, especially in the early stages, between hysteria and malingering. In both conditions at the commencement, there is the same small element of deception, which, if not recognized and corrected early, in the one case, grows enormously because the patient is not deceiving himself, but is becoming confirmed in his ability to deceive others; in the other case, the deception does not become so obnoxious, at least, because the patient has finally by a process of auto-suggestion, or even auto-hypnotism, aided possibly by suggestions of casual examiners, managed to deceive himself as well.

For example, in which category would one place the following case:

A young man was admitted to my ward in No. 3 Canadian General Hospital with a diagnosis of epilepsy. The following day we got orders to empty the hospital in preparation for new cases. I sent him to the Convalescent Camp, thinking he could be observed there. In the course of the week he was returned with a note to say he had had two attacks and was now in an epileptic condition and that they could not keep him. I camped in that ward until he had another attack, fortunately I did not have to wait long, and I saw that it was not of a genuine nature, and put it up to him. His story was this:

He had been at the front for twelve months, since the day of the German retreat, and had had no leave. He felt that it was due to him. Moreover, he showed me a letter from his sister, stating that his brother had been severely wounded and it was a question whether his leg could be saved. His aged mother had taken it very badly and was very ill and praying for his return. He said when he thought of all this he felt so badly that it just seemed to get worse and worse until he had an attack. He admitted that he could control them. I told him the army authorities tried to be just, and if he had been at the front for twelve months without leave, it certainly was due to him, but he must realize that to behave in such a manner was really only doing the essential part of himself a greater hurt than if he were wounded, and so on, and that if he would play the game, I would send him to the Base with a recommendation for leave. I kept him in a week or ten days longer and the change in him was remarkable. He was bright and active and cheerful around the place, and had no more attacks. Which category is such a case to go in?

Now, in England, I have found a great number of cases of paralysis of either one or both legs, or of an arm—of a psychogenetic origin—and relatively very very few of these have received wounds.

Let me detail two histories as I got them from the patients. I do not propose to show the patients for the reason that they have given me their confidence and I feel strongly that I have no right to abuse it.

One young man came in on crutches, he had become paralyzed completely in his right leg and partially in his left. Since using crutches, he had developed paralysis in his right arm. There were very marked vaso-motor changes in the right leg and arm, with loss of sensibility to pin prick. He was told that there was no reason why he could not move all his limbs perfectly. He would not believe this and said that he had tried, not any longer ago than that morning, when in the lavatory alone, and could not move them. After talking to him (and it is essential that such a talk be in private) he was soon persuaded to use his arm and to walk perfectly, and he has done so ever since. His story was this:

Whilst in the trenches, he had an attack of sharp pain in the right knee. He volunteered the statement that he had not used his leg as much as he might have and gradually it became more and more useless and his left leg became affected. When he began to use crutches, he developed crutch paralysis in the right arm. He had been paralyzed some three months. He said the reason for his not using his leg was not on his own account, but on account of his mother at home. Since enlisting, his grandfather had died, his two brothers had enlisted, and his mother was left alone and he wanted to get home to her. He seemed really grateful for his cure.

Another case shows another source of suggestion:

A young man was admitted with paralysis of both legs of six months' duration. Examination showed a not very robust youth. He had slight power of movement at the knee, none below. Loss of sensibility to pin prick of the stocking-like variety from knees down. One could stick the pin through a fold of flesh here and there was no bleeding. Reflexes were not pathological. Although he had to be carried into the examining room he walked back to his ward, up some stairs. He told me the following story:

Three of his brothers were at the front. He had paid $150 to have his teeth repaired in order that he might be accepted. After enlisting he had married and not been able to get his separation. His wife had become pregnant.

On a route march from Shorncliffe, during a heavy rain storm, he had to fall out. On reporting sick, the medical officer who happened to be doing locum, told him he had weak feet and ankles and they would always be a source of trouble. He lay around the huts, not getting much treatment. Excused duty. Everything wet and cold, and he proceeded to get worse. Was admitted to hospital and had been in bed six months and came to us on a stretcher. This man was evidently, in the first place, keen enough, chiefly, perhaps, because he was the only one of his family who had not yet volunteered, but in the interval he had been supplied with a strong and natural incentive to stay behind. The suggestion of the medical officer fell on fertile soil and sprang up and flourished.

One other patient I wish to bring up, a sergeant suffering from shell shock who had been in hospitals for almost a year. He was still troubled with a marked shaking of his right leg whenever he raised it from the ground. He had walked in supported by a silver headed cane. His trouble was evidently of a purely functional nature. This was explained to him and he was persuaded to stop it and walked out perfectly normally, saying that he would do without his cane. I suggested that it was customary for cases that were relieved of the necessity of using crutches or stick to donate them to the shrine. I was diffident about it because it was a fine cane and must have cost at least three dollars. However, my friend, the sergeant, evidently begrudged the shrine his cane and made a hasty retreat, carrying his cane in front of him, before anything more could be insisted on.

I could quote other cases but space forbids.

There are, however, questions we must ask ourselves:

1. Why do we so seldom see psychogenetic paralysis—apart from malingerers—in France, and yet see so many here? You may say it is because I am in a special hospital here where these cases are collected. Possibly there is some truth in that, but I do not believe it is the whole truth. Others in France with long service have told me that they have had the same experience there. It is a question to consider.

2. Why do we so seldom see psychogenetic conditions in men who have received a wound and never in cases where the disability from the wound is serious? The reason seems to me obvious. They have received an honourable wound and have earned their passage to "Blighty", and there is no reason for them to invent any further disability to attain their desire.

3. Why did my friend, the sergeant, begrudge his silver headed cane to the shrine on being cured? The next patient, who had a lesion of the sciatic, replied when he was asked if he would give a similar cane to the shrine if we cured him in fifteen minutes, "Just try me, I would give a good deal more than that."

Was it not that in spite of his disability of almost a year's standing, he felt himself that it was not as serious as it looked. I repeat therefore, what I said before, that in all these psychogenetic conditions, there is primarily an element of deception. Some patients who may be specially constituted mentally manage very soon to deceive themselves. In the others we find the pure malingerers. In the first group it is difficult to determine how much they themselves are deceived, but one can readily realize that the longer they are allowed to go on deceiving themselves, the more difficult will be their disillusionment.

The following remarks are based upon a study of sixty cases which have been under observation here in the Granville Canadian Special Hospital.* It must be understood that I have not attempted to include all cases diagnosed as shell shock, although many of these cases have come in with that diagnosis.

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*This series does not include by any means, all the cases of this nature we have tested in this hospital, but no list of these cases was kept, and through oversight in the rush of work, the additional diagnosis "Psychogenetic" was not added in many cases. The ones we have used are those whose case sheets were picked out in a general search, and many more might be added by a more exhaustive examination.

The symptoms have been very varied, but have generally shown muscular paralysis of one sort or another of a purely functional nature of one, or both legs or an arm, but there have been several cases of deaf-mutism and certain cases of mycolonus, with a few of what might be called trench back or a primary kyphosis of a functional origin, which have also been included. There have been included also a few cases of localized spasm of psychogenetic origin producing an equino-varus deformity.

The disability in all these cases has been purely mental in origin and the term psychogenetic has been preferred as being more correct; it does away with the necessity for making a distinction between those cases which may be suspected of voluntary simulation of symptoms and those others which are genuine. While it may seem hard on the genuine cases to bracket them with the malingerers, the separation of these in practice is, in many cases, by no means easy and it might happen that a patient who would be looked upon as a malingerer by some, by others would be considered hysterical, so that the use of this term prevents, in many cases, a grave injustice to some, whereas, in the present reading of the Act, as it is usually impossible to convict any individual patient of malingering, the use of the term loses us nothing. It has also happened in several cases, apparently genuinely hysterical, that more intimate study has seemed to point to a certain amount of deception on the part of the patient at the beginning of his disability, and only later, and apparently by a process of auto-hypnotism, the patient has become genuinely convinced of his disability and shown the usual stigmata of hysteria. At a certain stage, therefore, it may be very difficult to decide in which category the case should be put, e.g., the patient with convulsions.

Although the majority of these cases have come in diagnosed as shell shock, one is driven to the conclusion that this is scarcely the main factor, although it may be the immediately exciting one. Many of the individuals suffering from these symptoms have not been exposed to the action of shell fire, never having been to France, and in many who have been and who, when asked what they complain of, give the self-sufficient answer, "Shell Shock," it is learned on closer questioning that there has been no actual personal contact with the effects of shell explosions such as could possibly produce any pathological lesion of any organ or tissue. Many state that they lost consciousness, but on close examination it appears more likely that it was rather a state of hysterical amnesia.

It should be unnecessary to point out that the symptoms, which, from a military point of view, cause the disability in these cases, are *merely the symptoms of an underlying pathological condition* and quite analogous to, for instance, polyuria in diabetes, and with as much reason; but before enquiring further into the mental condition underlying, or its cause, let us consider an analysis of these cases.

First, we find 35 per cent. of these cases went to France as drafts to other battalions, and that the average time in France for all of this series was 2·8 months—and this means from the time they left England, and not necessarily all of it near the front line trenches—but if we exclude eight of the collected cases who did spend a fairly long time in France the average time for the rest is reduced to 1·9 month. Nine have never been there at all.

It would be interesting, in this connexion, to know what is the average time of a soldier in France apart from this type of case; but it would strike one that the war must be a very expensive procedure if it is not a great deal longer than this, especially as the average time between the dates of enlistment and the individual entering this hospital as a patient is—in twenty-one of the cases, where the date of enlistment is noted—almost fourteen and a half months.

It would appear, then, that these individuals are not of the sort that stand punishment well, and in fact, the not unusual history is that it was in the first serious bombardment in which they took part that they were returned; only seven out of the whole number received a wound, and in only two of these might the wound be termed serious. In both of these cases, the outlook in the first instance was undoubtedly serious—that is, might have been fatal—but fortunately in both they were completely healed at the end of three or four weeks and the only symptoms resulting were those of a psychogenetic nature. In the other cases, the actual wounds were trifling and should not have in themselves necessitated invaliding the patient to England.

For the recognition of the psychogenetic origin of the disability in these cases, a thorough examination of the nervous system to exclude with absolute assurance any organic lesion of the peripheral nerves, cord, or brain is necessary; and it is never wise to jump to conclusions without making this systematic examination, as it occasionally may happen that psychogenetic symptoms may be superimposed on genuine and organic disability.

It would appear from these statistics that, probably owing to the rush of work, this systematic examination of the nervous system is frequently neglected, as although these patients had—on an average—been in 3·75 hospitals at the base since leaving their battalion and spent—on an average—126·6 days from the time they went on the sick list before being admitted to the Granville, most of them were still unrecognized.

When one makes a comparison of this length of time with the length of time these patients remained in the Granville, which amounted to fifty-eight days, and when one realizes that the time here was not taken up in curing these disabling symptoms, but rather in correcting the underlying mental processes, one will realize that there is in these cases an opportunity for a great economy of material.

I can say, in fact, that, with about half a dozen exceptions, in all cases the disability disappeared in about fifteen minutes to two hours from the time of the beginning of the first treatment—Sir William Osler suggested describing this method as therapeutic jugulation, i.e., a choking off of the disease—the remaining time of their stay in the hospital was occupied in the endeavour to teach the patient to recognize and to correct the mental processes which had permitted such a condition to occur.

The exceptions to the above statements were certain cases of severe, persistent and general muscular convulsive twitchings, which might be termed myoclonic, and also two cases of trench back, which had been of several months' standing before admission, and in which every known, and apparently, in the patient's judgement, every conceivable method of treatment had already been tried without any results save that the patient was very antagonistic to any further endeavours. These patients, as was to have been expected, could not be cured in a moment and, in fact, added very considerably to the average number of hospital days for this series.

Of the total number of these cases, 71·4 per cent. were returned as fit for full duty; 16·1 per cent. were recommended for temporary base duty and 12·5 per cent. were recommended to be discharged from the army. In the latter groups, the recommendation was based, not on any gross disability, but rather on account of their inherent mental make up, they were deemed unsuitable for military life.

Let us now attempt to come to some conclusion as to the causes which may produce these symptoms, and in doing so it is necessary, first, to estimate as nearly as possible what these symptoms really mean. Clinical examination has shown no evidence of organic disease and, if we may call it this, the therapeutic test has shown that, where a man has been considered paralyzed for even as long as sixteen months, he has found himself able to walk, and walk well, in the course of an hour or two, so that apparently the underlying condition must be a state of abeyance of that part of the brain which supervises the movements of the limbs that have become paralyzed or which controls the coördinate action of the muscles involved.

Far more than this must enter into the picture, because in many of these cases of paralyzed limbs, there is the loss of sensibility of the hysterical, i.e., the glove and stocking, type, so complete that a pin may be driven through a large fold of flesh without causing any evidence of pain, which would point to the function of the sensory centres of the affected limb being also in abeyance; and, in addition to this, when a pin is driven through in this way, there results no bleeding. This positive sign cannot be accounted for by the simple negative lesion of certain cerebral centres lying in abeyance; moreover, after quite a long experience in civilian practice and in the numerous cases that have come under my observation among soldiers, in spite of no aseptic precautions having been taken, I have never once seen this pin thrust show the least sign of becoming affected; but this latter is by the way—we will return to it later. Evidently here there is some reflex of the sympathetic system acting on the vaso constrictors, which prevents this bleeding and I have demonstrated on more than one occasion that immediately after the patient has regained movement and control of the limb, the slightest pin prick will cause bleeding in the ordinary way.

In searching for a cause that would produce such a condition, one must first notice that the only factor which is common to all these cases is the exposure to, or the expectancy of being exposed to, grave danger, danger clothed in such terrifying forms as human nature has seldom been called upon to face previously. The reflex to such exposure to danger—prompted by the natural instinct for self preservation, common to human nature and to all animals—is expressed in the emotion, fear. I think one can say without danger of being contradicted, even by those heroic souls who have won well deserved recognition on the field of battle, that every individual exposed to these dangers experiences fear. The majority, fortunately, have sufficient strength of will, either inherited or developed by their education, as to be able to control any expression of fear, but nevertheless, there is little question that the bravest experience it. How, then, can this emotion produce such symptoms? I should have mentioned before that I have carefully excluded from this group of cases any case in which I had an at all reasonable suspicion that the patient was malingering.

One must naturally presuppose that in a large civilian army such as ours, although the enlistment is nominally purely voluntary, in reality it cannot be entirely voluntary. Many outside factors are brought to bear; large firms with many employees cut down the staff on account of the rise in expenses and diminished output, and they naturally let men of military age go first; and many of these, though fortunate enough to be of military age, are not necessarily of military inclination; the womenkind, in their natural enthusiastic patriotism, under the glamour of flags, and while still a long way from the grim reality, have no doubt exerted a strong influence in urging their youthful admirers in the fight for liberty; the fact that on enlistment, payment of debts is held over, becomes a very potent factor where the scarcity of ready money is felt; so that with these, and many other factors, such as the pride of coming from a fighting family, many are induced to join the army who have absolutely no taste nor inclination for the life that they must necessarily follow, and no stomach for the dangers that they must be called upon to face.

The exposure to physical and mental exhaustion, combined with fear, will necessarily render a man lightly suggestible who is not noticeably open to suggestion in civil life; and naturally those individuals whose education and tastes render them altogether opposed to this sort of life, and who have not developed a more than average amount of self control, might be expected to be more quickly affected than others who are buoyed up by the enthusiasm of patriotism or whose inclinations and training fit them better for the life they have undertaken. The work of Freud has shown us how, in civilian life, that great instinct which sits on an equal throne, the sexual instinct, may be the causative factor of precisely similar conditions and, while we cannot follow him nor his disciples in their ultramontane enthusiasm there is little question that there is a basis of truth in his ideas. In civilian life, our instinct of self preservation is rarely, if ever, called into action, while that other great instinct holds sway. While one cannot say that the opposite state of affairs is present in war, certainly the instinct of self preservation is most vividly in action. We have, then, immediately a mental conflict started between the instinct of self preservation and the moral sense.

Under the constant roar of shells and the insults of explosions, combined with natural physical fatigue, the individual's equanimity is very soon worn to shreds and his effort at self control worked to the limit, so that he is quite ready to believe, in this suggestible state of mind, that any muscular stiffness, which he might have experienced in civil life without apprehension, denotes some grave disease and causes a grave limitation of the functions of the part affected; or, if a shell falls close enough, so that possibly he is knocked over by the concussion and bruised, even to a slight degree, by falling earth and debris—much more so if he is badly bruised—strong arguments are added in the mental conflict on the side of self preservation and he is persuaded to believe that he has sustained some grave bodily injury, that his spine has been fractured, especially as it is quite possible that for some time he may actually have, following the concussion, a numbness in the lower extremities and inability to use them; and, apparently, under the emotional excitement it happens that the intellectual control, normally exerted by the higher centres, is often lost and no organic injury whatever has occurred. Apparently, the lower, or emotional centres, once having got control, strive to maintain it until by some means the higher centres are stimulated to regain their natural activity.

One sees in every day life the action of the emotional centres on the sympathetic and vaso motor systems in the blush of self-consciousness, in the pallor of the face, the dilation of the pupil and the acceleration of the heart from fear, in the increased secretion of urine and in the stimulation of the longitudinal unstriped muscles of the bowel, all acting under the influence of the emotions; and so here in these cases, with this abnormal action of the emotional centre one sees the vaso contractors acting when one expects the part to bleed.

It has occurred to me that the immunity from infection in the pin thrust might also be explained through the action of the sympathetic system. One has experienced the rapid formation of bed sores in cases of acute transverse lesion of the cord, forming, as they often do, within forty-eight hours and extending rapidly deep into the tissues of the buttocks, and one has explained them by the rather indefinite "loss of trophic impulse". Why have we not in these psychogenetic cases, got an increase in trophic impulse? The possibilities are obvious. If such a thing exists through the action of the lower cerebral centre on the sympathetic system, why could it not be induced by strong suggestion or hypnotism, and made to help in the fight against infection.

I wish here to distinguish between certain patients who may show precisely similar symptoms, but in the one case the individual has stood the gaff for six, eight or twelve months before being returned as a shell shock case; in the other and more common case these symptoms have developed after two to four weeks. In the former case it seems to me we have what I would term legitimate shell shock. The mental conflict that goes on is comparable to a physical conflict and we all have our physical limitations. In the latter case there has been it would appear little or no real conflict or rather, it has been entirely one sided. The former type is really a condition of exhaustion and requires rest of body and mind.

Cases of muscular twitching or myoclonus are in my experience not so commonly seen, they are apparently more in the nature of a pseudo clonus in highly strung individuals and which is considered the evidence of emotional tension associated with diminished cerebral control. It is practically always noticed, that in their endeavour to control the convulsive movements of the muscles, they bring all the muscles in the neighbourhood of the affected part into strong action, and in this way, emphasize, rather than control, the abnormal action. It is only when they can be taught to relax all muscles that the clonus ceases.

Theoretically then, one would think that any individual who had received a serious wound, which would naturally send him home and incapacitate him for several months, or render him permanently unfit for active service, would not be at all likely to develop any sort of psychogenetic paralysis, on the grounds that there is no longer any conflict to be waged between the instinct of self preservation and his moral sense. The latter is at rest as he is going home honourably wounded and he is under the care of those in whose care he has confidence. As a matter of fact, some time ago, I made the assertion that I had never seen these psychogenetic conditions in France or England in any individual who had been wounded. Since then, my experience has been enlarged considerably, but my statement holds good in the practical sense. In this series of cases seven had received wounds—two were serious; rather might have been, and no doubt caused anxiety in the advanced dressing stations for the first two days, but fortunately, although many vital tissues were in danger at the time, apparently no damage resulted. The wounds in other cases were very slight and should not have in themselves necessitated their returning to England.

Let me quote a few details of one of the seriously wounded cases referred to. Pte. J. M. on June 13th, 1916, was struck by a rifle bullet on the left side about an inch above the base of the neck. It went right through the neck in front of the vertebræ and made its exit on the opposite side of the neck higher up. He was admitted to this hospital on the first of August, with the left arm completely paralyzed. There was no disturbance of function of any of the cranial nerves, no difficulty in swallowing, and he stated that, apart from his arm, he felt perfectly well—but he had absolutely no power of movement in that arm. He was found to have a loss of sensibility to pin prick over the hand and arm to the shoulder, of the characteristic functional type. There was no noticeable wasting of the muscles and the reflexes were present and normal. He was persuaded to use the arm in a few minutes, and did so perfectly, and some weeks later was recommended for temporary base duty.

It seems to me that what happened here was as follows: At first, I am quite sure, he had a paralysis and numbness of the arm, due to the concussion of the nerve roots which go to make up the brachial plexus and that this might be expected to last for several days. At the same time, the serious view which any medical officer would express, on his first coming under observation in the advanced dressing station, and his own common sense, would develop the firm conviction in his mind that, as he was not dead, he certainly would not be called upon to return to the front, and, indeed, he might expect to be invalided to Canada.

However, it would be realized in a few days and while the nerves of his arm were still suffering from the effects of the concussion, that there was no danger to his life, and in fact, little of his health and fitness, and, at the same time, it would be impossible, probably, for a medical man to reassure him as to his arm. As the nerve cords recovered from the concussion, again would start the conflict, only now with a moral sense somewhat weakened by his experience, and the instinct of self preservation stimulated. The lower centres would still be in control, and the question of whether or not the arm could be used would never be submitted to the higher centres of consciousness.

The treatment of such cases must vary in some degrees with every individual case; but in every case it is necessary to acquire the confidence of the patient and, in order to do this, a thorough examination should be made, especially of the affected part. The presence, or absence, of any wasting of muscles should be noticed, remembering always that more disuse can bring about considerable wasting, but this is usually of a rather general type; next the reflexes and tendon jerks should be tried, and finally the sensibility of the skin to painful stimuli. It must always be borne in mind that the whole examination, from the taking of the history to the final test, should be made without asking any leading question, and with the greatest care not to suggest any answer which may, or may not, be expected. The whole onus of the reply should be left to the patient.

In the great majority of cases, one is able to exclude absolutely any organic disease, and this having been done, the patient should receive this assurance and the nature of the case should be stated to him frankly.

As a rule, he will immediately jump to the conclusion that one considers him "swinging the lead", but this idea can be readily dismissed with sincerity and tact, and his blamelessness in the matter suggested. At the same time it may be remarked that, while one has every sympathy with a man losing control of himself under the circumstances, now that he is assured he can use the limb it is his duty to use his will power to stir up that centre which has been lying in a lethargic condition, or otherwise, one's sympathy will no longer be justified. The little stimulus of fear of being suspected of malingering will act as an incentive to bring into action the defaulting centres.

With the firm conviction in the examiner's mind, gained by a thorough examination, that there is no lesion of an organic nature, exhortation and the firm assurance that he can if he only will, will often bring about a flicker of movement and finally complete control, but frequently one seems unable by any reasoning to incite the patient's will to action. In this case, it is customary to explain again the loss of control and its course, and state that if sufficient incentive were present he would move the limb without effort.

It is not difficult to make up the necessary incentive; all that is necessary is a strong, sudden and unfamiliar stimulus. This results in a reflex withdrawal of the limb before any cerebral inhibition can step in to prevent, and of course, the patient once having seen the limb move at his own initiative soon takes control of it. It is very essential not to rest satisfied before a perfect result is obtained. In the absence of any organic lesion, if the patient can move the part, he can move it perfectly and we cannot afford to be satisfied with less. One will be surprised what can be accomplished even in cases where, as in our experience here, the paralysis has lasted sixteen and twenty-two months. The latter patient had received a flesh wound of the arm in the retreat from Mons and had suffered from complete paralysis of the extremity for twenty-two months—having received a pension from the Imperial Government for a year. Within half an hour he had recovered the complete use of the arm and hand, so that he could catch a heavy object thrown at him quite perfectly.

The former, when admitted, had had a complete paraplegia for sixteen months. He had suffered with deaf-mutism asociated with paralysis of all four extremities as a result of "shell shock". He recovered his voice and hearing shortly, but only some months later, by the use of hypnotism, had he recovered the use of the arms—apparently the hypnotist could not influence the legs, however. Within an hour of my seeing him he could walk well, and even took a stroll on the parade the same afternoon—after sixteen months in bed, his only complaint being that his feet were tender—naturally the skin was thin for the ammunition boots after not using them.

To expect a cure of these cases by the use of hypnotism alone seems to me utterly unreasonable,—of course, in such suggestible individuals one can readily enough clear up symptoms by its use,—but when one realizes that the paralysis of the extremities or the deaf-mutism are merely symptoms which are produced by a loss of cerebral control, how can one expect to cure the disease by persuading the patient to give up his cerebral control still further, as he must in allowing himself to be hypnotised? Hypnotism is a condition which might be described as induced hysteria, and how can one expect to cure hysteria by superinducing the same condition?

Having thus stated my belief as far as hypnotism is concerned, I may add that I have felt justified in using it in one case, a man suffering from deaf-mutism associated with the most intense contortions of the face and tongue and a most depressed condition of mind. He was the picture of a dement. He sat beside his bed, the tears rolling down his face, apparently with no interest in anything but his own condition. He had had all sorts of treatment without effect. I argued that it was impossible to use reason with such an individual and, if I could clear up his symptoms, I could then explain and attempt a reëducative process—just as one would give morphia for the relief of pain until one could operate and remove the cause of the pain, and I had every reason to be satisfied with the result. After the third treatment, he had regained his speech and hearing, he had perfect control of his face and tongue, and reëducation became possible. I feel confident that that man left the hospital a stronger character than when he enlisted in the army, because he has now some idea of the functions of his mind and the necessity of self control. Most individuals know a good deal about the functions of their stomach; they realize that if they eat indigestible things they will suffer from certain unpleasant symptoms and they know how to go about getting relief; but very few realize that a similar maltreatment of their minds will cause even more unpleasant symptoms. There can be no question that happiness—not pleasure—is the only essential in this world. Riches without happiness is dross; health, a chimera. Happiness may be found associated with either wealth or poverty, physical health or deformity, but without happiness none of these count. A proper understanding of those functions of the brain which we term the mind is essential to happiness, and yet so few have been taught to be on as intimate terms with their minds as they are with their stomach.

It seems to me that the use of an anæsthetic in cases of deaf-mutism as a means of curing them, is utterly unscientific. If one considers the action of the anæsthetic on the cerebral centres, one must realize that what has happened is that, under its action, there has been a withdrawal of cerebral control and the patient speaks. Arguing backwards, it was the pressure of the cerebral control, or in other words his will power, which prevented him from speaking, and we have caught him by a trick—and it seems to me rather an unworthy sort of trick. We have not attempted to get at the real underlying pathological condition, and we have, therefore, left the patient liable to develop again the same symptoms, with, perhaps, less cause than he had the first time.

I have not included in this series those tremulous cases of so-called "shell shock", whose outstanding feature was a general lack of emotional control and who are apt to suffer a relapse or an exacerbation of tremulousness after any Zeppelin raid; although some of the cases referred to showed these symptoms as well. One of the annoying symptoms is horrible dreams of bombardments and consequent night terror. Naturally what is in a person's mind all day, will influence his dreams at night, and I have never failed to see relief of these latter symptoms when I got the patient occupied and interested in the work shops. The deep cut mental impression of his terrifying experiences soon becomes dulled by the superimposed impressions of healthy thoughts and interests. Still we find these patients jump every time a door slams even in the distance, although he knows it to be a door and nothing dangerous. It seems to me that such loss of control is perfectly analogous to the loss of control in the type of case we have been discussing—but one recognizes the greater difficulty in demonstrating to the patient that he can control himself if he only will. This difficulty has not, as yet, been satisfactorily overcome for all cases. While recognizing it as poor makeshift, I have found in these cases, that the mental incentive of a promised recommendation for discharge from the army as medically unfit as soon as they get control of themselves, works rapidly. After careful consideration of these cases, one is led to the conclusion that many cases might be prevented in their first development by the judicious entrance of a medical officer into the mental conflict, which may mean so much to the patient, on the side of his moral sense. Under the circumstances, it needs all the encouragement it can get.

Of course, it is necessary that men be sent as drafts to other battalions, but it is a point worth considering whether more care might not be given to make him feel at home and among friends as soon as possible after his introduction to his new battalion. Apart from the help the new draft will receive from the altruism inspired by being among men whom he feels will be friends, the desire to retain the respect of men whom he respects, will aid, to a greater or lesser degree, his moral sense in the conflict which may later on be waged in his mind.

Fortunately in the British Army, such extremes have not been necessary (and certainly at present, public opinion would not permit of resort to them—and it is devoutly to be hoped that there may never be occasion for it to change) but there appears to be no doubt that the Germans, with their usual logic combined with absence of sentiment, have, in their conscript army, been driven to supply such artificial aids to the self control of their men as an officer with a revolver behind; and the knowledge that there is a chance in going ahead, but no chance at all for him if he goes back unwounded—is a very certain crutch for his moral courage, which undoubtedly acts also on his instinct of self preservation.

One should always, however, realize that such individuals who are more than ordinarily suggestible, are such as the martyrs were made of, and, if their suggestibility be fully inspired by a great patriotism, or some other such enthusiasm, they may prove themselves capable of the greatest heroism.

DISCUSSION OF CERTAIN BORDERLINE PROBLEMS

A. CHOLECYSTECTOMY *vs.* CHOLECYSTOSTOMY (WITH NOTES ON TECHNIQUE AND COMPLICATIONS)

B. TREATMENT OF GASTRIC AND DUODENAL ULCER

C. RELATIONSHIP OF THE THYROID TO GRAVES' DISEASE

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THIS paper is based upon critical studies of certain groups of operations performed by my associates, Dr. F. R. Bunts and Dr. W. E. Lower, by my associates at Lakeside Hospital, and by myself. Included in these studies were the records of 1,161 operations on the gall-bladder and ducts; 497 operations on the stomach; and 2,030 operations for goitre, this number including 845 for exophthalmic goitre.

A.—CHOLECYSTECTOMY *vs.* CHOLECYSTOSTOMY (WITH NOTES ON TECHNIQUE AND COMPLICATIONS)

In our series we have seen cases in which a small stone has caused unbearable colic and others in which a massive stone has caused no pain; we have seen a massive stone erode its way into the small intestine causing obstruction, or into the colon or stomach; we have seen the stone lying free in an abdominal abscess, or migrating into the liver, or into the swollen duct walls; we have seen stones in pockets, and the gall-bladder transformed into compartments; we have seen the common duct as large as the duodenum, or reduced to the diameter of a mere string of connecting tissue; in some aged patients we have seen gall-bladders of vast size, while in others it has been but a small cicatricial mass; in a lank individual we have seen a Riedel's lobe project the gall-bladder

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into the pelvis; and in a broad-chested individual, have found it as high as the nipple; but it is not our purpose to discuss the exceptional cases, but rather those that are commonplace.

In our earlier experience, we tried to save all gall-bladders, but we soon noted that after cholecystostomy it sometimes happened that after the patient had left the hospital with his wound healed, he suddenly experienced the familiar gall-bladder pain, accompanied sometimes by a chill and a sharp rise in the temperature, the pain in some instances being so intense as to demand a hypodermic injection of morphine. At the site of the old gall-bladder drainage scar there is first tenderness, then puffing followed by redness and in a few days there appears a free discharge of mucus, pus, and debris, later followed by bile. After this the symptoms promptly disappear and the wound heals speedily. Later on this cycle may be exactly repeated. We soon found that this sequence occurred in those cases in which the infection had caused either thickening of the gall-bladder wall, or scar tissue and intermittent occlusion of the cystic duct; in cases in which the infection had extended into the crypts of the gall-bladder; and in cases in which stricture of the cystic duct had resulted from a decubitus caused by an imbedded stone; and in which the gall-bladders were large, white, thick-walled, and filled with thick mucus, brown debris, and sterile pus—a condition which usually appears in aged subjects. In safe risks, therefore, we excised the gall-bladder in these types of cases.

On the other hand, in cases of simple gall-stone colic, in which the gall-bladder and ducts are normal and no infection is present, we drain only. In addition, we employ only drainage, not excision, in grave hazards, such as cases of acute infections that do not clear up; or of gangrenous gall-bladders which are not easily removed; in extremely obese patients; in advanced age; or in the presence of hazardous chronic disease, where cholecystectomy is contra-indicated. In many of these cases, however, the cholecystostomy is later followed by cholecystectomy, after the acute storm has passed or after the margin of safety has been increased. In other words, in some cases the gall-bladder is saved because it is too good; in others, because the condition of the patient is too bad; that is, we do not kill the patient to relieve him of his damaged gall-bladder. Experience teaches us that after excision, however carefully planned, and after drainage, occasionally the symptoms will recur and in some cases a secondary operation may be required.

There is no majestic finality of judgement in cases of biliary stone or infection any more than in cases of stone or infection of the kidney or ureter.

In the technique of cholecystectomy, the risk of injury to the common duct under certain conditions cannot be ignored. When expedient, the cystic duct is plainly isolated by dissection, tied and divided; the vessels being then separated and divided. In fat obscure fields, the simple expedient of splitting the gall-bladder down to its lowest point is a splendid guide. If even a small amount of gall-bladder is left next to the cystic duct, a diminutive gall-bladder not only may form, but, moreover, may assume the prerogative of the normal adult gall-bladder, viz.: become infected and develop a stone. I have seen instances of both these events. In the case of common duct stone with a shrunken infected useless gall-bladder, in which I had excised the gall-bladder and from a position close to the common duct had extracted a tight fitting stone which had caused decubitus and infection, several months later a complete stricture of the common duct appeared. In this case, I mobilized the duodenum, opened it, excised the strictured common duct and brought the hepatic duct into the duodenum. For six years the patient has remained well.

In cholecystostomy the drainage question is quite settled; not so in cholecystectomy, however, for in the latter, when anterior drainage is used, occasionally fluid will accumulate in the right kidney pouch or between the diaphragm and liver. This condition is betrayed by interrupted convalescence; a little fever; some pain; and slight tenderness. This problem has been met by adopting unreservedly Rutherford Morison's method of drainage, which consists in a lateral opening at the bottom of Morison's pouch, and a double drain, one connecting with the sub-phrenic space above the liver, the other lying below the liver, the abdominal incision being completely closed.

The immediate operative result is controlled by means of an ample exposure through a vertical incision, this being further amplified by a transverse incision, if required; by gentle handling; by knife dissection; by nitrous oxid anæsthesia with a minimum amount of ether when required; by avoiding tight stitches; by encouraging moving about in bed; by the pre- and post-operative use of an abundance of water; by the administration of glucose and sodium bicarbonate solution administered by the Murphy drip, and by the infusion of normal saline solution. Finally, be it remembered that cholecystectomy following cholecystostomy is one of the safest of all operations; first, because the patient may be operated upon at the optimum point as regards risk; second, because during the interval between the first and second operations, the immunizing forces are mobilized in the operative field.

In brief, my conclusion is that the indications for cholecystostomy and for cholecystectomy are similar to the indications for nephrectomy and for pyelotomy in cases of kidney stone. Whether or not we shall remove a kidney depends on the existing condition; on the same basis we decide whether or not to remove a gall-bladder. If any gall-bladder, which is normal excepting for the presence of a stone, is excised merely on the basis that some gall-bladders have later trouble, then *all* gall-bladders and *all* kidneys would be excised. We believe that the ultimate decision must be made at the time of operation, this decision being based on the personal experience of the surgeon, the state of the gall-bladder and the condition of the patient. Both the gall-bladder and the patient should have a fair hearing and each is entitled to an unbiased judgement.

In our clinic, in consequence of our policy to individualize each case, cholecystectomies and cholecystostomies are now about equal in number.

B.—Treatment of Gastric and Duodenal Ulcer

The prime question in a consideration of the treatment of gastric and duodenal ulcers is this—shall they be treated by surgical methods alone, by medical measures alone, or by both combined? This question of medical treatment was not considered in our discussion of the treatment of infected gall-bladders, but it must be raised here. Ulcers of the stomach or of the duodenum are not so definitely cured by operation alone as are gall stones. Therefore, we must modify our course of treatment accordingly. My own conclusion is that if a patient possesses the necessary spiritual and financial qualifications, then a fair trial of non-surgical treatment with controlled alkalizing frequent feeding should be tried and tried faithfully. More and more am I prone to consider that the surgical results are due largely to the physiologic rest and the alkalization of the gastric contents. The end results are in no small degree dependent upon the extent to which the physician gains control over the patient—the patient gets out of the treatment what the physician puts into it of time, intelligence, and persuasion. It is interesting to note that after gastroenterostomy, most patients tolerate only small doses of alkalies. I attribute this to the fact that alkali enters the stomach *via* the new stoma as has been shown by Paterson.

If medical measures fail, then assuredly in view of the probability of cancer, of hæmorrhage, of perforation, ulcers should be dealt with surgically. Even after surgical treatment, however, it is imperative that diet and medication be strictly controlled by the attending physician for a year at least. The ancient practice of employing an orator to enforce the following out of directions by eloquent persuasion may well be profitably renewed here.

The operation is now safe—for including resections for cancer, the mortality rate is below 3 per cent.; and for gastroenterostomy alone it is less than 1 per cent. The problems are purely technical—hæmorrhage and leakage are absolutely controlled by the cobbler stitch; and the vicious circle may be eliminated in every case but the excessively fat mesocolon by mechanical adjustment and in the excessively fat by a modified Roux operation. Bad risks are controlled by a two-stage operation; anæmic cases by transfusion of blood; impending acidosis by water and alkalization; all cases are made more secure by light nitrous oxid anæsthesia and by anociation; while pneumonia is prevented by free moving about and sitting up in bed, by anointing the chest, and by the use of a warm water mattress on the operating table.

In seriously starved cases of gastric ulcer, Professor von Eiselsberg's method is excellent. A jejunostomy is first performed under local anæsthesia, the final operation being delayed until a safe margin of vitality has been established by feeding. Incidentally, the prolonged gastric rest usually cures the ulcer. Gastroenterostomy alone gives a rather light morbidity and mortality as compared with gastrectomy, as in the former the wound is not as extensive as in the latter operation, and the physiologic and anatomic adjustment is more readily made. The readjustment being accomplished, the gastric resection is performed with a wider margin of safety. Thus, by dividing the trauma and relieving the patient from the simultaneous burdens of extensive wound recovery and physiologic adjustment, the risk is decidedly less than when one massive chance is taken.

Rather by accident I have obtained a remarkable proof of the process of repair which follows gastroenterostomy, and also, as I am bound to infer, occurs in cases in which medical treatment has proved effective. In four instances in which in greatly emaciated patients the diagnosis of cancer has been made, it was deemed prudent to perform the operation in two stages, the first a gastro-enterostomy, the second to have been resection. In each of these cases, upon opening the wound for the second operation from six to seventeen days after the primary operation, no trace could be found of the large obstructing mass. In one case, the site was removed and examined microscopically and it was found that only a slight excess of fibrous tissue remained as witness of the ulcer mass. In these cases, if the resection and the gastroenterostomy had been performed in one séance, not only would there have been an unnecessary hazard as to life, but a needless operation would have been performed. These cases show that an absolute differential diagnosis between ulcer and cancer cannot be made by the surgeon either before or at the operation; and that in certain borderline cases even the diagnosis of the pathologist is not final—just as in cases of leg ulcer the pathologist cannot tell whether the displaced epithelium is coming or going. If the growth be penetrating, it is cancer; if produced merely by a normal healing process, it is not cancer. In certain borderline cases, the submission of specimens to equally competent pathologists has elicited diverse opinions.

If the patient is dismissed from the surgeon's care to the same habits of life and the same dietetic carelessness that existed when the ulcer originated, and if in certain cases mouth infections and teeth defects are uncorrected, then there is bound to result a certain percentage of failures. It is just as illogical to exercise no care over a post-operative ulcer patient as it would be to dismiss a post-operative exophthalmic goitre patient without therapeutic instructions and prolonged oversight.

The Control of Gastric Hæmorrhage. In every case of severe hæmorrhage, whatever its cause, the transfusion of blood is the ideal remedy, for the transfused blood not only replaces the lost blood, but in many instances it also overcomes the blood defect which was the primary cause of the continued hæmorrhage.

In cases also in which the vitality of the patient has been greatly reduced, the margin of safety may be widened by transfusion. In hæmorrhage from gastric or duodenal ulcer, its immediate arrest may be accomplished by utilizing the following great principle in biologic adaptation:

As a defence against death from hæmorrhage a mechanism has been evolved for increasing the coagulation of the blood as the death point approaches. Increased coagulation with a normal circulation would hazard life as the clot might be washed along as an embolus, but with the low pressure and the faint circulation near the death point, clotting becomes safe. As in phylogeny, hæmorrhage was the preëminent cause of death and of unconsciousness, this defence mechanism may be called into action by any cause that lowers the blood pressure or even by the fear of catastrophe, or by the sight of blood, and the similitude of the pre-death point is produced, namely, unconsciousness or *fainting*. It is logical, therefore, to utilize the fainting point clinically as an indication that the blood pressure is sufficiently low for the hæmorrhage to be safely arrested by coagulation.

The patient being kept under continuous observation and control, an attempt is made to bring him to the fainting point by having him sit upright in bed. If the upright position does not produce blanching, a thready pulse and a moist forehead, then the blood may be sequestered in the extremities by adjusting a tourniquet around the thigh just tightly enough to block the venous but not the arterial flow. In this way enough blood may be tentatively removed from the general circulation to reduce the blood pressure until the fainting point is reached. The length of time this point should be maintained is empyric, but a brief period is sufficient to assure the formation of a secure clot at the bleeding point. Not only are the open blood-vessels plugged but the patient has left in his body plenty of blood to flood the blanched brain when the bandages are released and the posture altered. Thus we evoke the last ditch defence as seen in the death point arrest of hæmorrhage in typhoid, in tuberculosis, in extrauterine and birth hæmorrhage. We beat death by saving the blood—we eat the biologic cake and save it too.

C.—Relationship of the Thyroid Gland to Graves' Disease.

In considering the cases of Graves' disease which have been surgically treated in the Lakeside clinic we have found that three facts stand out preëminently: first, in every instance the thyroid was enlarged; second, the histologic changes in the thyroid were neither constant nor characteristic; and third, in every instance, resection of the thyroid improved or cured the disease. In view of these facts, how shall we decide whether or not hyperplasia of the thyroid is a characteristic of Graves' disease.

A study of the cases at the Lakeside clinic shows that the percentage of occurrence of hyperplasia varies from year to year. The presence of hyperplasia apparently depends upon the intensity of the disease, its duration and the stage of the disease at which the operation was performed—whether before or at the height of the hyperplasia; whether after the hyperplastic stage has been succeeded by the colloid stage; or whether, on the other hand, the drive has been so intense that the thyroid cells themselves had been destroyed, so that the gland consisted almost entirely of fibrous tissue, in which case no hyperplasia existed. It is true, however, that the clinical signs enable us to predict the histology correctly in 90 per cent. of the cases. It should be added that in our clinic we do not recognize thyrotoxicosis but classify all cases as Graves' disease.

That hyperplasia is not a characteristic of Graves' disease is shown further by the following facts:

(*a*) The excision of a sufficient amount of a colloid goitre or of an adenoma in a typical case improves or cures the disease just as it is cured or improved by the excision of a hyperplastic gland. It must be added, however, that as a rule the most striking relief comes after the excision of the hyperplastic gland in cases in which the duration of the disease has been short but intense. Nevertheless, the degree of surgical relief is independent of the histology of the gland.

(*b*) Although in Graves' disease the most intense hyperplasia may be found in exceptional cases, on the other hand among the total number of hyperplastic thyroids which at this moment exist in the United States and Canada, only a small percentage are incident to Graves' disease. In most pregnant women, in many adolescent girls, in a large proportion of advanced cases of tuberculosis, and in numerous cases of intense prolonged pyogenic infection, the thyroid is not only hyperplastic but the histological picture is identical—no one could look back through the microscope and say this is the hyperplasia of Graves' disease, this of pregnancy, this of tuberculosis—and there are a few cases in which hyperplasia has followed the excision of too much thyroid gland and no iodin has been given. On the other hand, in only from 50 to 75 per cent. of the cases of Graves' disease, a negligible group compared with the groups enumerated above, is the thyroid hyperplastic. We are forced to conclude, therefore, that hyperplasia of the thyroid is no more the cause of Graves' disease than it is the cause of pregnancy or of tuberculosis or of adolescence. In each case hyperplasia is an end effect, not a cause. But here the analogy ends, for although resection of the thyroid does not end pregnancy; does not assist adolescence; does not cure the infections; it does mitigate or cure every case of Graves' disease.

Why does surgery mitigate some cases and cure others—why are there occasional relapses? It is in this inquiry that we shall find our best cue to the relationship of the thyroid to Graves' disease, and to the reason why the disease is so strongly controlled by surgical measures.

In our case histories we find that in the cases not wholly relieved or in which partial relapse occurred after temporary relief, the causes of the relapse may be roughly classified as follows:

(*a*) *Psychic Drive.* In this class we find patients who have been threatened with the loss of or have lost positions of importance and have no other means of support, especially if they have others dependent upon them. Among these are daughters with dependent mothers, the relapse occurring when the loss of the position is threatened. Relapses appear among teachers, stenographers, telephone operators, etc., but are rare, as is the occurrence of the drive, among those who earn their living by physical labour—laundresses, cooks, scrubwomen. The more intense the struggle of man against man, the more difficult it is to cure Graves' disease completely. The disease is rarely found in the degenerate, or in idiots, or in moral defectives.

As an experiment, I sent some patients, whose disease had grown on the soil of the struggle against want and poverty, to a pleasant sanatorium, and relieved their financial strain through the assistance of a philanthropic patroness of the hospital, thus blocking the human relations drive. These patients, in their rapid convalescence and complete cure contrasted strikingly with those still swimming against the stream. Unhappily this beneficent prescription can be filled too rarely.

Other causes of a psychic drive, which we have seen cause relapse during the early months of convalescence, are the sickness and death of parents or children; financial disaster; exposure to grave danger, as a railway wreck, a fire, etc. I have had operative recoveries in which each of these misfortunes has occurred in the early months of convalescence, causing serious relapses.

(*b*) *Acute Infection.* In some cases of Graves' disease, convalescence has been delayed, the patients have been made worse or have shown sudden relapse as the result of tonsillitis, an acute cold, a tooth abscess, acute appendicitis, mastoiditis, diphtheria, etc.

(*c*) *Intestinal auto-intoxication.* Intestinal auto-intoxication occurs in the more chronic type of Graves' disease, and strictly speaking is not a cause of relapse, but rather a continued exciting primary cause. Unless the auto-intoxication is recognized and controlled from the beginning, only a partial relief may be expected.

(*d*) *Pregnancy*. Conception usually does not occur until Graves' disease is well in hand, but in some of my cases pregnancy has provided the drive that produced the relapse. With the termination of the drive by childbirth, the disease has subsided just as it subsides on the release from strain and worry, when an abscess is opened, etc.

(*e*) *Adolescence*. Graves' disease in the midst of the drive of adolescence presents a difficult problem, for whereas the drive of an acute infection, of a financial reverse, of hard work, of the danger of losing a position, of the illness or death of relatives, are all controllable, the drive of adolescence is not controllable and operative results in the adolescent period are correspondingly less favourable.

We can see clearly, therefore, that the degree of completeness of the cure of Graves' disease, assuming that adequate surgical measures have been employed, depends upon the presence or absence of the forces that are capable of inaugurating the disease. In exophthalmic goitre we see the symptoms come and go as the stimulating forces of the internal and external environment ebb and flow; and in consequence we see the ebb and flow of the blood supply and of the size of the thyroid. Now since the thyroid has no physical connexion with the outer environment excepting through the mediation of the sense organs and the nervous system, it follows that the thyroid changes are end-effects, not primary causes. If the driving organ, the brain, is undriven, the thyroid is quiescent. In Graves' disease the entire energy-transforming mechanism has been speeded by some driving force in the internal or external environment, and for some reason the acceleration continues even after the original driving force is withdrawn. Man's motor mechanism being automatic, there must exist inhibitors as well as accelerators, but in Graves' disease the mechanism is in a state of continuous self-acceleration from an, as yet, not understood defect. Once equilibrium is established over a period of time, by rest, by changing environment, or by operation, improvement or cure follows.

Now, the thyroid's primary, perhaps only function, like that of the adrenal, is the fabrication, storage and adaptive discharge of an activating chemical agent, just as the brain cells fabricate action currents. Speeding up any one of these three activators—the brain, the adrenals, the thyroid—speeds up the whole mechanism. If the activity of any one is depressed, then the activity of the whole mechanism is depressed. No one of these organs can substitute for any other. Therefore, in that curiously altered state of the kinetic system in which even after the excitement is withdrawn, there remains an automatic speeding, if an essential link, like the thyroid, be depressed by operation, by so much will that great automatic drive, Graves' disease, be decreased. Quite obviously, the relief afforded by the removal of the thyroid gland could be equally well afforded by breaking any other link in the kinetic chain. The excision of a corresponding amount of the adrenals should be as effective. If a patient with Graves' disease could hibernate for a season, the disease would undoubtedly be cured; and we cannot doubt that it would be mitigated or cured by acute cerebral softening. By resecting the thyroid, therefore, we are simply checking the automatic speeding of the mechanism by breaking the most accessible link in the kinetic chain.

We conclude, therefore, that the exciting causes of Graves' disease are environmental stimuli; that although the thyroid shows no consistant histologic lesions, and although the disease does not originate in the thyroid, nevertheless the thyroid plays a necessary part in the disease process; that surgical treatment exerts a specific effect upon the progress of the disease, but that maximum results demand a combination of surgical and medical methods.

ANNOUNCEMENT is made by Dr. M. M. Seymour, Commissioner of Public Health of the Province of Saskatchewan, that on and after September 1st of this year, free distribution of diphtheric antitoxin will be made by the provincial bureau of public health.

Editorial

THE MONTREAL MEETING

AFTER a period of two years during which no meetings were held, the forty-eighth annual meeting of the Association was held at Montreal, June 13th, 14th, and 15th. It would appear from the generous support given to this meeting by the profession that in omitting the meetings of 1915 and 1916 the Executive Council erred perhaps on the side of undue timidity. The registration exceeded 300, which even for peace times would have been well up to the ordinary standard of attendance. Of the total registrations 70 were new members. From Ontario there were 95; from Quebec 149; of whom 120 were Montrealers. Each of the other provinces sent its quota. As was to be expected, owing to the distance and other causes, the number from the western provinces was small.

The quality of the programme was exceptional. The addresses in medicine, surgery, and public health, were of the usual high standard. The address in medicine, by Dr. Theodore C. Janeway, an old friend of many of our members, was indeed a scholarly effort, and certainly ranked with the best ever given before our Association.

A crowded audience greeted Dr. Shepherd, whose address, "Past and Present," was listened to with the closest attention and evident appreciation.

Dr. Charles J. Hastings, of Toronto, gave a most interesting address in public health. A large number of the laity of the city showed their interest in public health matters by attending.

Each section had an abundance of splendid papers. In some perhaps there were too many, the overcrowding being more noticeable on the first day. Some especially good papers were read in the section of surgery, notably that by Dr. J. H. Cotton of Toronto on the new ether. In the larger sections of medicine, surgery and obstetrics, there was a large attendance, while in the other sections it was well up to the average.

Most of the contributors to the programme were Canadians, but several good papers were given by our friends from across the line. Several prominent men who had promised papers were at the last moment unable to come by reason of having received orders to join their military units. Amongst these were Dr. Thomas McCrae, of Philadelphia, and Dr. J. J. MacKenzie, of Toronto.

Special interest was shown in the public health section in which a large number of interesting and instructive papers were read. Some very important problems in social service work were discussed and strong resolutions were adopted on such important subjects as the control of venereal diseases, the formation of a Federal Bureau of Public Health and the establishment of a Department of Hygiene and Physical Education. A most important suggestion was made by the chairman of the public health section, namely, that the Public Health Association of Canada be asked to associate their organization with the public health section of the Canadian Medical Association. This suggestion received the approval of the Executive Council, and subsequently was approved by the general session. The fusion of these two public health organizations will, if accomplished, undoubtedly greatly strengthen the hands of our Association in this most important branch of its activities.

The attendance at the general sessions was not all that could be desired. This was no doubt partly due to the fact that the time alloted to this part of the programme was not entirely satisfactory. At the same time we would urge that more attention be paid by our members to the general business of the Association. It is unquestionably most desirable that at future meetings a definite time be assigned for the meetings of the general session, when all will be free to attend; and also that the Committee of Arrangements take means at the time of the meeting to impress upon the members the importance of taking an active interest in the business of the Association.

Quite a feature of the meeting was the banquet at the Ritz-Carlton Hotel. Apart from the luncheons given in the College this was the only gathering of a social character, and the fact that well over half the members present attended, demonstrated its popularity. The chief attraction of the occasion was unquestionably the President's address. Dr. Blackader touched upon many problems which to-day face the profession in general, and the Association in particular, and indicated clearly how these problems should be met. At the close of the banquet the President received the congratulations of those present upon the clear and concise way in which he had dealt with these questions.

In response to an invitation from the Winnipeg Medical Society, that city was chosen as the next place of meeting, Vancouver still foregoing its claims. Dr. James McKenty was elected President, and in his hands we may safely leave the fortunes of the 1918 meeting. The Montreal meeting, undertaken with considerable hesitation, has demonstrated beyond peradventure that he may count upon the loyal support of the members of the Association.

We are requested to state that President Blackader, and the members of the Committee of Arrangements, desire to extend to all those who attended and helped to make the Montreal meeting the success it undoubtedly was, their most sincere thanks.

THE ADDRESS IN SURGERY

THE Address in Surgery of this year's meeting of the Association was a noteworthy one as coming from the doyen of Canadian surgeons, one who has borne a reputation second to none in our country. It was noteworthy also as coming from a man who has been almost as widely known for his knowledge of art and his wide reading and general culture, as for his surgical attainments. We are reminded of a saying of the late von Mikulicz, who on giving up his work said to a friend, "I have no grudge against life. I have worked hard, but my work has found recognition." It may not be presumptuous to think that Dr. Shepherd might rightly adopt these words for his own.

Turning to the Address itself, one finds, as one would expect, many things said, many opinions expressed, that derive an interest from and demand the attention due to his long experience. Once again he tells us in the written word, as often before in the spoken word, that we should stand in Canada more firmly on our own feet in medical matters, and that we should give more encouragement to the work of our own people. As a step further, he suggests that we should have our own Royal College of Surgeons, affiliated with that of Great Britain. The remark is obviously true and wise. We ought certainly—those who have ambition and do proper work—to be able to write after our names, F.R.C.S. (Canada) instead of or in addition to the recent F.A.C.S. of our neighbours to the south. This attitude, however, need not be chauvinistic. We can also prize the opportunity so freely offered by the Americans, of associating ourselves with all their endeavours towards a higher level of scientific surgery.

Dr. Shepherd goes on to give a most interesting, if somewhat summary, review of the big advances in surgery that he has seen in his long experience. How keen his interest still is in matters surgical can be seen in his references to the modern work of the war in the matter of antisepsis and shock. He has been a great reader and is still reading.

To refer in detail to all the points of interest which he takes up in the Address, would occupy far too much space. The original, we are sure, will be read by everybody with pleasure and instruction. We hope that this will not be the last time that Dr. Shepherd will address the Association.

MODERN CONCEPTION OF PUBLIC HEALTH ADMINISTRATION

THOSE who heard the public address on State Medicine by the Medical Officer of Health, of Toronto, were no doubt convinced that the section on state medicine made no mistake in their efforts to present to the public a modern public health administration. The Canadian Medical Association, representing as it does the medical profession from all parts of the Dominion, was desirous of going on record as having recognized its responsibility to the nation in life saving, disease prevention, and the development of the physical fitness of our people. We have recently been hearing and reading much about the future of preventive medicine. Dr. Hastings has given us an outline of the present activities of this branch of medicine as embraced in the organization of the Department of Health in Toronto.

The duties of departments of health were necessarily very circumscribed until the science of bacteriology placed their work on a scientific basis, which was necessary in order to indicate the desired modes of action. It has become apparent that, if this knowledge of bacteriology or the principles indicated by it are to be efficiently executed, the public must be educated.

It was quite apparent that, in the mind of the speaker, the future of preventive medicine teems with almost limitless possibilities; that the education of the public to the necessity of greater activity was creating a wholesome, social unrest that would soon prompt the public to demand, if diseases were preventable, that they be prevented. The awakening of the public conscience is in itself a guarantee of greater activities.

The speaker emphasized the importance of industrial diseases and industrial hygiene, and the toll exacted by industrial diseases every year, most of which are preventable. Reference was also made to the wastage, oft-times in the most productive period of life, through the wasting diseases of middle life, much of which might be prevented or postponed by changed methods of living. More than a passing reference was made to the unpardonable neglect of duty of administrators of public health as regards the control of venereal diseases.

Emphasis was placed on social service as a solution of the social problems in the homes, which can only be solved by a proper follow-up system and reference to responsible social agencies—the social problems frequently constituting basic factors in the production of disease. Modern organizations of public health embrace the conditions necessary for social uplift, and thus render a service to the people.

Probably one of the strongest notes struck by Dr. Hastings in his address, was his reference to health insurance, which points the way to an ideal public health service. The urgent need for a more efficient method of dealing with the problem of the wage earner's health, and a means by which the burden of responsibility can be placed where it belongs and at the same time stimulate coöperation of all concerned in its solution, is apparent. Health insurance is the most feasible measure, inasmuch as it is the method by which the cost of sickness is distributed amongst those oft-times responsible for the conditions causing the sickness, namely the employer, the employee and the government or the municipality, and thereby the burden upon the individual is lightened. Furthermore, it gives a financial interest in the prevention of sickness to those who are responsible for the conditions causing it.

UNIVERSITY HOSPITAL UNITS

"THE regiment never dies!" The individual life may be sacrificed but the glory of heroism remains. It becomes an attribute, an ideal that each generation strives to uphold; the heritage of every member of the regiment. Such a tradition naturally engenders an *esprit de corps*, which is possible only in a permanent body or organization. A military unit which will be broken up at the end of a campaign or whose *personnel* is constantly changing lacks that inward cohesion that is so essential. It was a realization of this truth that led the universities of Canada, soon after the beginning of the war, to request permission to send overseas hospital units composed of men from a particular medical school, men with common ideals and traditions, acquainted with each other and bound together by a love for and a desire to add to the honour of their Alma Mater.

In a recent issue of the *Times* it was suggested by Lieutenant-Colonel Sir James Fowler that hospitals should be named after the schools, college, university, or town from which the personnel had been drawn and which formed the bond uniting the individual members of the staff to one another. The proposal has found favour with the War Office and permission has been given to try the experiment. A Middlesex Hospital unit is to be mobilized under the direction of Sir James Fowler. The officers of the unit will be Middlesex men, the matron, sisters and nurses will be chosen from those trained at the Middlesex Hospital, and the V.A.D. nurses will be selected from families connected with that institution.

As far as the British Overseas Forces are concerned, however, the idea cannot be considered a new one. It was in the autumn of 1914 that the authorities of McGill University applied to the Department of Militia for permission to form a McGill Military Base Hospital for overseas service. The necessary permission was accorded and, at the beginning of 1915, mobilization of No. 3 Canadian General Hospital (McGill) was commenced. The personnel was chosen from the staff and students of the medical faculty of McGill University, and the nursing sisters from the hospitals connected with the University. Colonel H. S. Birkett, C.B., dean of the faculty of medicine was appointed to the command of the unit and is still with the hospital in France. A similar offer made by the University of Toronto was accepted in February, 1915, and mobilization of No. 4 Canadian General Hospital was at once begun, the personnel consisting of members of the medical faculty of the university, and the officer commanding being Lieutenant-Colonel J. A. Roberts. In March, 1915, as soon as the necessary permission could be obtained from the military authorities, a hospital unit was also mobilized by Queen's University. This was No. 5 Stationary Hospital, Lieutenant-Colonel Frederick Etherington being the officer in command. Upon arrival in England this unit was enlarged and converted into No. 7 Canadian General Hospital (Queen's).

Other universities were equally anxious to do their share in providing units for overseas service. No. 7 Stationary Hospital, C.E.F., was given by Dalhousie University in 1916 and was placed under the command of Lieutenant-Colonel John Stewart, professor of anatomy in the university. No. 10 Stationary Hospital was mobilized by Western University and commanded by Lieutenant-Colonel Edwin Seaborn, associate professor of clinical surgery and lecturer in surgery at Western University. The St. Francis Xavier unit, No. 9 Stationary Hospital, was mobilized and proceeded to England under the command of the late Lieutenant-Colonel Roderick C. McLeod, whose death unfortunately occurred at Bramshott. The unit is now under the command of Major H. E. Kendall. The Laval University Hospital was mobilized in Montreal as No. 6 Stationary Hospital, but was enlarged subsequently and designated No. 8 Canadian General Hospital. This unit is under the command of Lieutenant-

Colonel G. E. Beauchamp, of Montreal, and is at present stationed at Vincennes, near Paris. Offers of hospital units were also made to the military authorities by the Universities of Alberta and Manitoba, but were not accepted.

Not only were these hospitals mobilized by the various universities but large sums of money were given voluntarily for their equipment, which was complete to every detail. Moreover funds were established for maintenance and any further equipment that might be necessary.

The success that has attended the university medical units sent by Canada across the seas, and the enviable reputation they have established in France, in Egypt, and at Salonica, often under adverse and trying conditions, give us faith in the success of the Middlesex unit, and the proposal made by Sir James Fowler that such units should be given a permanent place in the medical services of the Empire, and be known by the name of the institution or place from which they originated, will find a ready echo in the hearts of Canadians.

THE VENEREAL DISEASE PROBLEM

DURING recent years we have witnessed crusades, popular as well as scientific, directed toward the solution of many problems of interest to the public health. The investigation and control of the acute infectious diseases, tuberculosis, cancer, poliomyelitis, the feeble-minded, alcoholism, industrial diseases, have all come up for consideration. Much energy has been expended and undoubtedly important practical results have been accomplished. It has therefore been a matter of surprise that the greatest scourge of humanity, moral as well as physical, should so long have escaped the public attention which its importance to the nation demands. This has in part been due to a spirit of hopelessness in attacking a problem of such magnitude, involving family and social relations, the control of prostitution, alcoholism and other contributory factors, marriage regulation, even the housing problem, wage earning and other economic questions. Besides there has been a certain prudishness on the part of both the medical profession and the public, as well as certain moral considerations, which have stood in the way of dealing with sexual diseases with the same deliberation and scientific candour as with other great public health questions. Even before the war, however, it was evident that something would have to be done to abate a scourge fraught with grave danger to the state, and events since that time have only served to impress every thoughtful person with the increasing urgency of intelligent and aggressive action..

Those present at the International Medical Congress in London, in 1913, will agree that venereal disease was the subject of outstanding importance, and one of the first practical results which followed that meeting was the appointment of a Royal Commission to consider and report upon it. The report of this Commission has appeared during the past year, and while of great value, yet one cannot read it without being convinced of the paucity and inaccuracy of the statistical and other data at present available. This is very clearly shown by Sir William Osler in his recent Lettsomian lecture.

The discovery of the spirochaeta pallida as the cause of syphilis; the introduction of the Wassermann reaction and the investigation of the spinal fluid, emphasizing the wide-spread and intractable nature of the infection and its definite relationship to other systemic diseases; and the addition of diarseno-benzol to our list of remedies, have all stimulated an unprecedented amount of research and produced, during the last decade, a new literature which has practically scrapped previous knowledge, and is helping to establish the whole matter on a new and more scientific basis.

While most attention in recent years has been directed towards syphilis, yet as Osler points out, the gonococcus, though not a great destroyer of life, is yet the greatest known preventer of life, conservative estimates stating that 50 per cent. of sterility in women is due to this cause.

The incidence of venereal disease in the community at large, as well as in hospitals, has recently been studied by many investigators. The results obtained naturally have shown wide variations in urban and rural communities and in hospital practice. Accurate statistics are not yet available, but all are agreed as to the prevalence of infection. It is important, however, to avoid unnecessarily alarming the public by overstatement.

The apparently greater prevalence of venereal disease shown by recent statistics is probably accounted for more by refinement in our methods of diagnosis then by their actual increase in the community. While wars in general, have been associated with an increase of these diseases, yet there does not seem sufficient warrant for the alarming statements appearing from time to time in the lay press regarding venereal disease among our soldiers at the present time. In this connexion we are glad to read the reassuring statement made by Mr. Foster, financial secretary to the War Office, in the British House of Commons, February 28th, 1917, that "it should be generally known that the venereal rate in the army to-day is no higher than it is in ordinary times of peace". There should be no attempt either to exaggerate or to minimize the seriousness or urgency of the venereal disease question, but to deal with it in a sane manner on the basis of facts established by accurate investigation.

The venereal disease problem is one in which the medical profession should lead in educating public opinion and in influencing the course of legislation. With this end in view, it is necessary that medical societies should have competent committees at work to collect information and that these, through our national and provincial associations, should endeavour, as far as possible, to bring about uniformity of action throughout the Dominion.

As it is essentially a public health question, it would appear best to have it under the control of the various provincial boards, which already have organizations ready to carry out the work. This is the course which has been adopted in Great Britain and one which will obviate any undesirable duplication of machinery and division of authority.

The compulsory notification of cases is a matter which will give rise to difference of opinion, but it is difficult to see how these, any more than any other contagious diseases, can be effectively controlled without it.

The same statement applies to compulsory treatment, with segregation of patients where necessary. The latter will necessitate the opening of hospitals for the reception of these diseases and suitable provision being made for their diagnosis and treatment. In this connexion properly organized out-patient clinics can serve a most useful purpose.

As many of the victims of venereal disease belong to the indigent class, it will be necessary to provide for free diagnosis and treatment, though indiscriminate pauperization should be carefully guarded against. It would therefore be advisable, in line with the policy already established in the case of serums and vaccines used in the treatment of other infective diseases, that expensive remedies such as diarseno-benzol, should, where possible, be manufactured in the laboratories of the Boards of Health, so as to reduce the increased expense attendant on their purchase from private manufacturers.

As there would be strong objection on the part of private patients to expose themselves to unnecessary publicity, it is obvious if we are to avoid concealment of infection, that the medical profession as a whole should coöperate in carrying out any organized campaign, and that therefore the necessary facilities for instruction, diagnosis and treatment be placed as fully as possible at their disposal.

Legislation should be sought to prevent the otherwise inevitable exploitation of these patients by unqualified practitioners and quacks, and advertising in the lay press should be rigidly controlled.

The whole venereal disease problem was discussed in the Public Health Section of the Academy of Medicine, Toronto, in January last, and as the result, a representative committee of the Academy was appointed to consider the question. The following report was submitted and adopted:

WHEREAS the problem of venereal disease which recent investigations have shown to be widespread in this country, has not received consideration commensurate with its importance,

THEREFORE BE IT RESOLVED that the Academy of Medicine, Toronto, urge upon the proper authorities that the following action be taken to combat this menace:

I. That an educational campaign be actively carried on by
- (a). The Provincial Board of Health,
- (b). The universities and medical schools providing more adequate teaching of the subjects of syphilis and gonorrhoea.
- (c). The medical faculties of the various universities and medical colleges throwing open their lectures and clinics on venereal disease to practitioners of medicine.
- (d). The teaching of the subject of venereal disease to the general student bodies of the universities.

II. (a). That all general hospitals situated in cities and receiving government aid shall provide or arrange for the diagnosis and treatment of venereal disease.
- (b). That all standards of laboratory diagnosis be under the control and direction of the Provincial Board of Health.
- (c). That the Province be divided into districts each to be served by a laboratory or laboratories designated by the Provincial Board of Health for this purpose.
- (d). That the Provincial Government be asked to set aside $10,000 to be administered by the Provincial Board of Health for remuneration for services and equipment in conducting these laboratories.

The Committee afterwards waited upon the Provincial

Government, which cordially received the recommendations made and set aside $10,000 for the initiation of the work.

ANNOUNCEMENT is made of the publication in England of a periodical entitled *Recalled to Life*, which will be devoted to the discussion of matters affecting the welfare of disabled soldiers and sailors. The editor is Lord Charnwood and the periodical will appear every two or three months.

THE regulations recently adopted in the Province of Saskatchewan, impose a penalty varying from fifty to two hundred dollars upon every person who purchases or sells intoxicants, or any mixture, compound or prescription which contains liquor in excess of the amount required to render soluble or preserve the ingredients used, for other than sacramental or medicinal purposes. Liquor for bona fide purposes of manufacture can be obtained only upon production of a written permit from the Attorney General.

AT a special meeting of the Toronto Academy of Medicine on July 10th, the following resolution was passed unanimously: "Whereas it has always been the custom to have wounded and invalided soldiers retained under military regulations until discharged, and treated professionally by physicians and surgeons responsible only to the military authorities; and whereas in Canada a plan has been followed whereby wounded and invalided soldiers are placed under the professional care of physicians and surgeons, who are made responsible to a civilian commission; and whereas the hospitals for the care of returned wounded and invalided soldiers, instead of being under the control of the Militia Department, have been placed under the control of the Military Hospitals Commission; and whereas up to the present the Commission have not assumed full control of these hospitals inasmuch as the medical care of the patients is still, to a large extent, under medical officers responsible in part to the military authorities and in part to the Military Hospitals Commission, there exists a state of dual control which is eminently unsatisfactory, and does not ensure provision of the best treatment available for the soldiers; therefore be it resolved, and it is hereby resolved, that in the opinion of the Academy of Medicine, Toronto, there should be one united medical service in Canada, and that the medical care of all soldiers, invalided or otherwise, should be placed directly under the Surgeon-General, to be known as Surgeon-General of Canada, with direct responsibility to the Honourable the Minister of Militia, and with a seat on the Military Council; further, that the Surgeon-General of Canada should absorb the duties of Director of Medical Services, Invalids, and be chief medical officer of the Military Hospitals Commission, and be *ex-officio* a member of the Military Hospitals Commission and of the Executive. Further, that Surgeon-General Fotheringham, who has been recalled from overseas to become Director of Medical Services, Invalids, should be appointed forthwith as Acting Surgeon-General of Canada; further, that the views expressed by Surgeon-General Fotheringham in his evidence before the Parliamentary Committee on Returned Soldiers at its sitting on June 12th, 1917, are generally endorsed."

The War

The following letter was received on July 3rd, from Lieutenant-Colonel G. E. Armstrong, C.A.M.C.

To the members of the Canadian Medical Association.

Asked by your President to contribute something to the meeting of the Canadian Medical Association, I cast about for a fitting subject. Some one of the many phases of war surgery would seem indicated. My time is wholly taken up, for the most part, in visiting the Canadian hospitals in England that are engaged in active treatment, and also the convalescent hospitals. There is certainly here much of interest: war surgery has an interesting side; and one might write many histories of most unusual injuries and many of most wonderful escapes.

On the whole it is depressing to go through our hospitals day after day and week after week, observing the thousands of wounded, many of them sadly mutilated. It brings home to one the cruelties of war, and when at leisure one thinks of the homes of these men—of their dependents, their father, mother, brothers, wives and children, sisters and lovers, and a feeling of horror comes over one, at least over the writer. How can such things be at this period of what we were once proud to call our twentieth century civilization? It is the old story of "Man's inhumanity to man." And yet there is a glory—a savage glory, if you will—in meeting the enemy in the struggle for supremacy.

May I take this opportunity of saying that never in the history of warfare has there been greater bravery, resourcefulness, endurance, and perfection of every detail of attack, than is presented by our Canadian soldiers on the Western front?

It is too soon to prepare any statistical table. The case reports are not yet available. I have had a clerk at work for nearly six weeks, trying to get facts together for a paper, but it is hopeless.

The great question of our Canadian hospitals in England is the treatment of the results of infection received on a battlefield, located, for the most part, in an agricultural country that has been tilled and fertilized for centuries, and in which the rainfall is considerable and the sunshine less than obtains in Canada.

Shock and hæmorrhage are more frequently met with in France than in England, although even in England we occasionally see very serious secondary hæmorrhages, requiring for their control ligature of important vessels. Another fact impressing itself on all of us is the importance of early treatment. The evolution of abdominal surgery has taught all abdominal surgeons the necessity of meeting infection of the peritoneum promptly: quick and decisive action is as urgently demanded in infection wounds of the soft tissues and of the bones and joints.

A few men, including our friend—DePage, at LaPanne—will show extraordinarily good results: the reason is that besides being an exceptionally good surgeon of wide experience in war surgery, he has, because of his location, received his cases early, often during the first six hours after receipt of wounds, has had a carefully trained lot of young men to help him, and has been permitted to retain personal control and supervision of the patients as long as needed.

I wish to emphasize my point, which perhaps I have not made quite clear, that wounds treated during the first six or eight hours and kept continually under treatment, without the break unavoidably associated with transportation, do better than those treated during the second twelve hours and then transported some distance to a Base hospital, a change often requiring, under war conditions, twelve to twenty-four, or sometimes thirty-six hours.

Among the extraordinary conditions observed recently has been "A lesion simulating aneurysmal varix".

At home, before coming overseas, and again since taking up my work in England, I have met a number of cases of traumatic aneurysm. Several of them had been operated upon successfully by the surgeons attached to our hospitals and by myself. We usually recognize three varieties of traumatic aneurysm—the false aneurysm—aneurysmal varix, and arteriovenous aneurysms. I recently had an opportunity of uncovering a lesion that, so far as I know, has not been described, and which simulated very closely the condition known as aneurysmal varix. The patient was a private whom I found under treatment for a fracture of the leg, in a convalescent hospital. Union had taken place, but the leg was cold, the foot cold and somewhat swollen, and there was an unusual degree of disability. On examination I found that in addition to the fracture of the leg he had sustained a nasty shrapnel wound of the right thigh about the middle. There was present a long scar over the course of the femoral artery in the middle of the thigh, indicating that an incision had been made by a surgeon, but for what reason the patient did not know. At the upper end of the scar, just below Poupart's ligament, the pulsation of the artery was visible. On palpation there was felt a very distinct thrill. On auscultation a loud churning bruit was heard. There could not be any doubt that we had before us a definite aneurysmal varix. Along the course of the vessels in the middle of the thigh there was nothing abnormal to be seen, heard, or felt. At the lower end of the inner side of the thigh, however, just over Hunter's canal, there was a distinct thrill felt and a definite bruit heard on auscultation.

It was difficult to account for this lower condition, especially as the middle of the thigh was silent. The patient was transferred to an active treatment hospital and through the courtesy of the surgeon-in-chief, our mutual friend, Lieutenant-Colonel Hutchison, I uncovered the site of the upper lesion. After exposing the superficial femoral artery just below the giving-off of the profunda branch, I came upon the point where the femoral artery and vein were united. The finger placed upon the artery at this point felt the bruit, and the churning sound may be described as boisterous. Crile clamps were placed upon the vessels above and below and I proceeded to separate the vessels which, to our surprise, was accomplished without any hæmorrhage: there was no communication between them. As soon as they were separated the bruit disappeared altogether. The bruit remained over Hunter's canal, however, as distinct as before. This area was accordingly uncovered, and a point found where the artery and vein were intimately adherent by scar tissue, and over this point the finger felt the loud churning swishing bruit. The vessels at this point were carefully separated by blunt dissection: there was no bleeding, and no communication between the artery and the vein. As soon as the separation was completed the thrill disappeared. A layer of fat was in each instance placed between the vessels with the object of preventing reunion of the vessels and the wound closed.

The symptoms of aneurysmal varix in this case were clearly due to the close adhesion of the artery and vein by scar tissue. I do not so far see how the two conditions could have been differentiated before exposure, unless possibly, the multiplicity of areas might have aroused suspicion. At each point, before the vessels were separated, the artery was dilated. I estimate that its capacity at the point of adhesion was increased 25 or 30 per cent. That the bruit was not due altogether to the local fusiform dilation is proved by the fact that the bruit disappeared as soon as the artery was separated from the vein. It is worthy of note that after the separation the artery contracted to normal size under observation, in, say, five minutes. One is, therefore, compelled to believe that the bruit was due to the adhesion of the wall of the artery to that of the vein. I can only suggest that the bruit was in part, at least, due to the adhesion interfering with the movement of the arterial wall at the point of junction with the vein, contributed to possibly by the associated fusiform dilatation of the artery, but not altogether to the latter, because the bruit disappeared immediately the vessels were separated, while the fusiform dilatation remained. The prognosis remains to be determined.

Will you please receive this short communication as an evidence of my desire to contribute to the success of the 1917 meeting of the Canadian Medical Association.

G. E. ARMSTRONG,

Lieutenant-Colonel, C.A.M.C.

Book Reviews

THE PRACTICAL MEDICINE SERIES; COMPRISING THE VOLUMES ON THE YEAR'S PROGRESS IN MEDICINE AND SURGERY. Under the general editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. X, NERVOUS AND MENTAL DISEASES. Edited by HUGH T. PATRICK, M.D., professor of neurology in the Chicago Polyclinic, and others. Series, 1916. Publishers: The Year Book Publishers, 327 S. LaSalle Street, Chicago. Price $1.35. Price of the series of ten volumes, $10.00.

This volume of the "Practical Medicine Series," edited by Patrick and Bassoe, of Chicago, keeps up the high standard to which we have become accustomed in the neurological volumes. The condensation of the very large number of original articles reviewed by the authors is very well done, and particularly there is to be noticed the fact that the book is written in decent English. The subject matter includes, general symptoms, the neuroses, the cerebro-spinal fluid, diseases of the meninges, the syphilitic diseases of the nervous system (in a chapter by itself), diseases of the brain, of the spinal cord, and of the peripheral nerves. There are also some forty pages given to psychiatry; also a few good photographs illustrating both clinical and pathological subjects. The volume contains much more than a mere compilation of the work of a large number of neurologists; there are numerous notes contributed by the editors from their own experience. It would be quite impossible to single out particular subjects for commendation, but one notices particularly a good review of the treatment of cerebro-spinal meningitis, notably an examination of the causes of failure. No less than twenty-five pages are given to the syphilitic diseases of the nervous system; these commensurate with the importance of the subject. The intra-cranial injection of salvarsanized serum is reviewed, the results of this method appear to be favourable and the operation is shown not to be dangerous, 102 cases having been treated in this way without ill results in any case.

There are a certain number of reviews of neurological work concerned with the war, such as the occurrence of late abscess after gunshot wounds of the brain, also wounds and injuries of the spinal cord. Poliomyelitis is given sufficient attention. In particular there is a good review of Gordon Holmes' Goulstonian lectures on "War injuries of the Spine"; a most excellent piece of work. Taken as a whole the volume is warmly to be recommended.

THE JOURNAL OF UROLOGY (Experimental, Medical, Surgical), Edited by HUGH HAMPTON YOUNG. Vol. I. Published bi-monthly by Williams & Wilkins Company, Baltimore. Price $5.00.

Another medical journal added to the already overcrowded list. We frequently hear the remark, "Too many medical journals." It is doubtless true. But there is still plenty of room for good publications, and this is especially so in the department of urological medicine. Urology has made great advances in the last decade and the need of a *Journal of Urology* has been very apparent.

Published along broad lines; the medicine, surgery, chemistry, embryology, bacteriology and pathology of the urinary tract, will be discussed. The editorial personnel is composed of heads of departments from several leading hospitals. The articles in the first issue are of considerable variety and all of high order, and a successful future for the *Journal of Urology* is predicted.

Books Received

The following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

HANDBOOK OF SUGGESTIVE THERAPEUTICS, APPLIED HYPNOTISM PSYCHIC SCIENCE: A Manual of Practical Psychotherapy, designed especially for the Practitioner of Medicine, Surgery, and Dentistry. By HENRY S. MUNRO, M.D., Omaha, Nebraska. Fourth edition, revised and enlarged. Publishers: C. V. Mosby Company, 1917. Price, $5.00.

CANCER: ITS CAUSE AND TREATMENT. By L. DUNCAN BULKLEY. A.M., M.D., senior physician to the New York Skin and Cancer Hospital. Vol. II, 282 pages. Price $1.50. Publishers: Paul B. Hoeber, New York, 1917.

THE INTERNAL SECRETIONS: THEIR PHYSIOLOGY AND APPLICATION TO PATHOLOGY. By E. GLEY, M.D., member of the Academy of Medicine of Paris. Translated from the French and edited by MAURICE FISHBERG, M.D., clinical professor of medicine, New York University and Bellevue Hospital Medical College. 231 pages. Price $2.00. Publishers: Paul B. Hoeber, New York, 1917.

ACUTE APPENDICITIS. PRACTICAL POINTS FROM A TWENTY-FIVE YEARS' EXPERIENCE. By C. HAMILTON WHITEFORD, M.R.C.S., L.R.C.P., late specialist in surgery, Military Hospital, Devonport. 68 pages. Price 4/– net. Publishers: Harrison & Sons, 43 Pall Mall, London, S.W., 1917.

PULMONARY TUBERCULOSIS: ITS DIAGNOSIS, PREVENTION, AND TREATMENT. By W. M. CROFTON, M.D., lecturer in special pathology, University College, Dublin. 119 pages with 20 illustrations. Price 6/– net. Publishers: J. & A. Churchill, 7 Great Marlborough Street, London, 1917.

The Causation of Sex in Man. A new Theory of Sex Based on Clinical Materials. By E. Rumley Dawson, L.R.C.P., M.R.C.S., late member of the council of the Obstetrical Society of London. Second edition. 219 pages with 22 illustrations. Price 7/6 net. Publishers: H. K. Lewis & Co., 136 Gower Street, London, W.C., 1917.

International Clinics. A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles on Treatment, Medicine, Surgery, Neurology, Pædiatrics, Obstetrics, Gynæcology, Orthopædics, Pathology, Dermatology, Ophthalmology, Otology, Rhinology, Laryngology, Hygiene, and other topics of interest to the students and practitioners. Edited by H. R. M. Landis, M.D., and others. Vol. II. Twenty-seventh series, 1917. Publishers: J. B. Lippincott Company, Philadelphia, London and Montreal.

Diseases of Children. A Manual for Students and Practitioners. By George M. Tuttle, M.D., clinical professor of Pediatrics, Washington University Medical School; and Phelps G. Hurford, M.D., Pediatrician, St. Louis Lutheran Hospital. Third edition, thoroughly revised and enlarged. 584 pages with illustrations. Publishers: Lea & Febiger, Philadelphia and New York, 1917.

Eye, Ear, Nose and Throat. A Manual for Students and Practitioners. By Howard Charles Ballenger, M.D., professor of oto-laryngology in the Chicago Eye, Ear, Nose and Throat College; and A. G. Wippern, M.D., attending occulist and aurist to St. Elizabeth's Hospital, Chicago. New second edition, thoroughly revised. 503 pages, illustrated with 180 engravings. Publishers: Lea & Febiger, Philadelphia and New York, 1917.

A Practical Treatise on Fractures and Dislocations. By Lewis A. Stimson, B.A., M.D., LL.D., professor of surgery in Cornell University Medical College, New York. Eighth edition, revised and enlarged. 933 pages with 475 illustrations. Publishers: Lea & Febiger, New York and Philadelphia, 1917.

Obituary

CAPTAIN A. P. CHALMERS, C.A.M.C.

Captain Adam Peden Chambers, who died on May 16th, last, at St. Lucia, British West Indies, was born in Perth County in the province of Ontario in 1865. He was educated at Toronto and graduated from Trinity Medical College in the year 1892. He practised for a time at Oil Springs and at the time the war broke out was in practice in Toronto. He at once volunteered for active service and was attached to the medical staff at Camp Borden, subsequently going to St. Lucia. His death was the result of injuries sustained in an accident. Dr. Chalmers leaves a widow and two children.

Dr. William M. Caldwell died July 3rd, at St. John, New Brunswick, in the seventy-second year of his age. Dr. Caldwell, who was born in King's County in the province of New Brunswick, of English parentage, graduated from the Medical School of Harvard University in 1867, and practised at Lancaster Heights for some time. Later he went to Newcastle Bridge, Queen's County.

Dr. Wellington C. Jeffers, who died at Lindsay, Ontario, on July 17th, after a short illness, was widely known throughout that district. Born in Dundas, Ontario, in 1864, a younger son of the late Reverend Wellington Jeffers, of Belleville, Ontario, he was educated at the old Grammar School, Toronto, and entered the medical faculty of Victoria University, graduating with honours in 1867. Dr. Jeffers went into practice in association with Dr. Rolph at Toronto. Subsequently, he went to the United States where he practised for some years, but returned to Canada and took up practice at Oakwood and Lindsay. A widow, two sons, and four daughters survive him.

Dr. Edward S. Blanchard, medical superintendent of the Falconwood hospital for the insane, died at Charlottetown, Prince Edward Island, at the age of sixty-eight years. Dr. Blanchard was born at Windsor, Nova Scotia. He leaves a widow, one daughter, and a son who,is at present on active service.

Dr. Thomas McQuaid, who died in May last at Sault Ste. Marie, was born in 1877 and graduated from the Western University in 1906.

Dr. Aime Romulus Larochelle died on June 24th, at Sorel, where he had been in practice since 1908. He graduated from Laval University, Quebec, in 1903.

News

ONTARIO

The sum of $10,000 has been given to the Englehart Hospital at Petrolia, by Mr. J. S. Englehart, chairman of the Northern Railway Commission, for the purpose of adding a maternity wing to the hospital. The hospital itself was also the gift of Mr. Englehart and was formerly his private residence.

A deputation recently waited on the Hon. W. D. McPherson, provincial secretary, with the request that a Royal Commission be appointed by the Ontario Government to enquire into and report on the best means of dealing with the problem of the feebleminded in the province. The attention of the Provincial Secretary was drawn to the fact that resolutions in favour of the appointment of such a commission had been passed by the Anglican Synod and the District Methodist Conference. Among the members of the deputation were Dr. P. H. Bryce, of Ottawa; Dr. F. J. Conboy, of Toronto; Canon Plumptre and Father Minehan.

The following cases of infectious disease were reported in Toronto during June: diphtheria, 100; scarlet fever, 58; typhoid fever, 4; measles, 203; cerebro-spinal fever, 2; infantile paralysis, 2; erysipelas, 5; tuberculosis, 75; chicken-pox, 62; whooping cough, 44; mumps, 37.

QUEBEC

At a meeting of the Société Médicale de Montréal on May 22nd, last, a resolution was passed to the effect that regular medical inspection of children should be established in all schools, urban and rural, throughout the province of Quebec. Attention was drawn also to the insufficiency of the salaries paid to physicians entrusted with the work of school inspection.

MEDICAL COLLEGES

Laval University

THE following candidates have successfully passed the examinations in medicine at Laval University, Montreal: I. E. Bachand, Henri Baril, R. Beaudoin, A. Bellerose, B. Bibeau, D. Bisson, Arthur Bourdon, Ernest Brunet, P. A. Charette, Amédé Demers, C. E. Dubuc, Henri Fortier, Arthur Gagné, L. Z. Gauthier, Roch Hébert, Lucien Helie, Oscar Laberge, J. G. Langis, C. A. Langlois, J. P. Lapointe, J. B. Mandeville, Roméo Pepin, Emile Phaneuf, L. R. Robillard, L. Robert, R. Rolland, J. C. St. Pierre, A. Therien.

ARMY MEDICAL SERVICES

SIR EUGENE FISET, D.S.O., deputy minister of militia, has been decorated with the Cross of the Legion of Honour by the French Government. The investiture was made at Montreal by M. Bonin, the French Consul, on July 14th.

THE new wing of the Ontario Military Hospital at Orpington, Kent, was opened on July 5th, by the Right Honourable Walter Long, Secretary of State for the Colonies. The hospital now has a capacity of 2,800 beds.

THE Military Cross has been awarded by His Majesty the King to the following members of the Canadian Army Medical Corps:

CAPTAIN HUGH HART, "who showed the utmost gallantry and courage in attending to the wounded while under heavy fire."

CAPTAIN DOUGLAS BALLANTYNE KENNEDY, who "directed the work of stretcher-bearers for forty-eight hours without rest, while under heavy enemy fire".

CAPTAIN RONALD HUGH MACDONALD, who "went out in view of the enemy, who were shelling a disabled aeroplane, and extracted a wounded airman".

CAPTAIN ROBERT JAMES MANSON, who "at great personal risk stopped alone and dressed nine wounded men".

Captain Arthur Chester Armstrong, C.A.M.C. "For tending wounded under heavy fire."

The *Croix de Guerre* has been awarded by the French Government to Lieutenant W. E. Ord, R.A.M.C.

Canadian Literature

Original Contributions

The Canadian Practitioner and Review, April, 1917:

Hydatid of the lung—Report of two cases	F. A. Clarkson.
The radium treatment of malignant disease of the lip and skin . . .	H. B. Aikins.

The Canadian Practitioner and Review, May, 1917:

Notes on the differential diagnosis of pulmonary tuberculosis .	J. H. Elliott and C. Sheard.
Edward Jenner, 1749–1823. Remarks made on presenting a portrait of Jenner to the Academy of Medicine, Toronto, March 6th, 1917 . . .	J. Ferguson.
Presentation of some rare books and a historic cane to the Academy of Medicine, Toronto, April 3rd, 1917 .	J. Ferguson.

Dominion Medical Monthly, April, 1917:

Some radium treatments	G. Elliott.

Dominion Medical Monthly, May, 1917:

The radium treatment of malignant disease of the lip and skin . . .	W. H. B. Aikins.
The synergism of lactucarium and ethyl carbamate: a pharmaceutical and clinical study	P. Bartholow.

La Clinique, June, 1917:

Appendicite au cours de la grossesse. .	A. P. Heineck.
Comment prévenir l'infection puerperale.	G. Juilly.

Medical Societies

CANADIAN PUBLIC HEALTH ASSOCIATION

The Sixth Annual Congress of the Canadian Public Health Association is to be held in Ottawa on September 27th and 28th next. The Canadian Association for the Prevention of Tuberculosis will meet at the same place on September 26th. Furthermore, the Canadian Conference on Charities and Correction meets in Ottawa also, during the early part of the same week.

Among the subjects of particular interest to be discussed at the meeting of the Canadian Public Health Association is that of National Health Insurance which will be discussed at length. The symposium on this subject, in which well-known authorities will participate, will take place on the first afternoon.

Another matter that will come up for discussion is venereal diseases in their military and civilian public health aspects. Such questions as infant welfare and child hygiene will also receive attention. A separate section meeting of laboratory workers is also being arranged.

Special railway rates from all points east of Fort William have been obtained from the Eastern Canadian Passenger Association, fare and one third, plus 25 cents on the certificate plan.

Those who wish to contribute papers should submit titles, stating the length of time required to read the paper, to the General Secretary not later than August 15th next.

COLLEGE OF PHYSICIANS AND SURGEONS OF ONTARIO

The annual meeting of the Council of the College of Physicians and Surgeons of Ontario was held in the last week of June, 1917.

The officers elected were: president, Dr. W. E. Crain, Crysler, Ontario; vice-president, Dr. R. Ferguson, London, Ontario; registrar-treasurer, Dr. H. Wilberforce Aikins, Toronto; solicitor, H. S. Osler, Esq., K.C., Toronto; auditor, Mr. J. F. Lawson, Toronto; stenographer, Mr. G. Angus, Toronto; official prosecutor, Mr. J. Fyfe, Toronto.

Dr. Edmund E. King, in his address, gave a very interesting and instructive resumé of all matters affecting the College, with which the executive committee had had to deal during the Council recess.

The Honourable Dr. Thornton, Minister of Education for the Province of Manitoba, and a member of the Canada Medical Council, addressed the Council at length, upon questions in which both Councils are mutually interested. Dr. Spankie read the report of the representatives of this College on the Canada Medical Council dealing with the same matters.

The Council passed a resolution, requesting the Dominion Government to take such steps as may be necessary to prevent or prohibit the sale of all patent or proprietary medicines, containing alcoholic content in excess of 2½ per cent.

A committee was appointed formally to impress upon the Dominion Government "the importance and the alarming menace to the public from the serious prevalence of venereal diseases" in the community.

The views of the Council, touching upon Canada-wide qualifying requirements, were expressed in the following resolution: "This Council is of the opinion, that there should be only one qualifying examination in the Dominion."

Under resolution, a special committee was appointed to give effect to the substance of the following motion: "That for military purposes, a census of the medical profession of Canada be taken, and that a card should be sent to each practitioner of medicine in Ontario, requesting him to fill out and return the same to the registrar of the College. The information thus obtained to be compiled and placed at the disposal of the Department of Militia and Defence."

The Council adopted the recommendation of the education committee that the representatives of this Council on the Canada Medical Council be instructed to enter into negotiations with that body, looking to adoption of the views of the Canada Medical Council as embodied in the resolution passed by it in June, 1917, viz: "That a special committee be appointed to enter into negotiations with the Provincial Councils for coöperation in conducting examinations with a view to the adoption of the Dominion Examinations as the single portal of qualification in the Dominion of Canada."

The Council adopted a list of Medical Colleges in the United States, whose graduates, subject to stated limitations, would be permitted to become candidates for the final qualifying examinations of the College. The following is an extract from the regulations:

"6. Students graduating subsequent to July 1st, 1916, from "recognized" medical colleges in any of the United States shall submit a certificate from that State Board of Licensure that the candidate is fully qualified for admission to the examination of that State Board. Certificates will be accepted from State Boards, (1) which accept similar certificates from this Council and (2) whose standards are equivalent to those of this Council.

"7. The following schools in the United States are "recognized": University of California College of Medicine, Berkley, California; Leland Stanford Junior University School, San Francisco, California; Yale University School of Medicine, New Haven, Connecticut; North Western University School, Chicago, Illinois; Rush Medical College, Chicago, Illinois; Indiana University School of Medicine, Indianapolis, Indiana; Johns Hopkins University, Baltimore, Maryland; Harvard University Medical School, Boston, Massachusetts; University of Michigan Medical School, Ann Arbor, Michigan; Washington University Medical School, St. Louis, Missouri; University of Minnesota Medical School, Minneapolis, Minnesota; University of Nebraska College of Medicine, Lincoln, Nebraska; Columbia University College of Physicians, and Surgeons, New York; Cornell University Medical College, New York; Syracuse University College of Medicine, Syracuse, New York; Ohio State University College of Medicine, Columbia, Ohio; Western Reserve University School of Medicine, Cleveland, Ohio; Jefferson Medical College, Philadelphia, Pennsylvania; University of Pennsylvania, Philadelphia, Pennsylvania; University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania."

NEW BRUNSWICK MEDICAL SOCIETY

The thirty-seventh annual meeting of the New Brunswick Medical Society was held in St. John on July 17th, 1917, Dr. S. C. Murray, Albert, Albert County, the retiring president, presided.

The reports of the officers were submitted. The officers for the ensuing year were then elected. They are: president, F. H. Wetmore, M.D., Hampton; 1st vice-president, G. G. Melvin, M.D., St. John; 2nd vice-president, J. H. Allingham, M.D., Fairville; treasurer, J. T. Dalton, M.D., St. John; recording secretary, S. H. McDonald, M.D., St. John; corresponding secretary, A. E. Macaulay, M.D., St. John; trustees, D. R. Moore, M.D., Stanley; J. B. Gilchrist, M.D., Norton; L. M. Curren, M.D., St. John. Five representatives to the Council of Physicians and Surgeons of New Brunswick were elected by the society. They were Drs. L. M. Curren, A. F. Emery, G. A. B. Addy, W. W. White, and G. R. J. Crawford, of St. John.

MEDICAL SOCIETY OF NOVA SCOTIA

The Medical Society of Nova Scotia held its sixty-fourth annual meeting on July 4th and 5th, under the presidency of Professor Fraser Harris, of Dalhousie University, Halifax. On the invitation of President MacKenzie, the meetings were held in the Carlton Street building.

At the afternoon session of the first day there was a joint meeting with the Association of Medical Health Officers of Nova Scotia.

The following were the papers read: "Observations on some cardiac conditions," by Dr. Birt, Halifax; "A brief outline of the causes and remedies of increasingly common degenerative diseases," by Dr. W. B. Moore, Kentville; "Amputations," by Dr. Chisholm, Halifax; "Renal tuberculosis," by Dr. D. W. MacKenzie, Montreal; "Orthopædic surgery in war," by Lieutenant Colonel MacKenzie Forbes, A.M.C., C.E.F., Montreal; "The military medical service of yesterday and of to-day," by Lieutenant-Colonel F. MacKelvie Bell, A.D.M.S., 6th Military District, Halifax.

The President's address was entitled: "From the vague to the concrete in science and medicine."

On Tuesday morning, July 5th, there was a clinical meeting at the Victoria General Hospital when cases of medical and surgical interest were shown by the following: Doctors H. K. Macdonald, J. G. Macdougall, Weatherbe, MacLennan, Mäder, Murphy and M. A. B. Smith. A case of cure of alcoholism by hypnotic suggestion was demonstrated by Major Cutten (President of Acadia College).

On Wednesday, July 4th, the Halifax members entertained the non-city members to lunch; there were only two toasts: "The King," by Dr. Kirkpatrick, chairman of the entertainment committee; and "Our guests," by Dr. Fraser Harris, replied to by Colonel Forbes. On Thursday afternoon there was an excursion by water to visit the beautiful North West Arm and the great ocean terminals now in course of erection. In the evening, members were present at a band concert at the Wagwoltic Club.

The place of next year's meeting was decided on as Liverpool; the president, Dr. J. W. Smith, of Liverpool; first vice-president, Dr. A. L. G. Forbes, of Lunenburg,; second vice-president, Dr. B. Francis, Sydney Mines; Dr. J. R. Corston was reëlected secretary-treasurer. The representatives to the Executive Council of the Canadian Medical Association elected were: Doctors J. W. Smith, Fraser Harris, and J. G. Macdougall.

The representatives to the Provincial Medical Board of Nova Scotia elected were: Doctors Forbes, Lunenburg; Maclean, North Sydney; Moore, Kentville; T. H. Macdonald, Meteghan; J. G. Macdougall, Halifax, and Professor Nicholls, Halifax. The general impression was that the Halifax meeting was both pleasant and profitable.

MEDICAL OFFICERS OF HEALTH OF NOVA SCOTIA

The third annual meeting of the Association of Medical Officers of Health of Nova Scotia met in the House of Assembly in Halifax, on July 3rd, under the presidency of Dr. George DeWitt, of Wolfville. The congress was welcomed by the Premier of Nova Scotia and addressed by His Honour the Lieutenant Governor. Both speakers expressed themselves in sympathy with the efforts of the medical profession to conserve the health of the people at large.

Dr. W. H. Hattie read an important paper on the "Legislative aspect of venereal diseases." The Association later passed a resolution requesting the Federal government to enact such legislation as will control the spread of venereal diseases especially to be feared on the return of the troops from overseas service. It was pointed out that both the Imperial and the Australian Parliaments had already enacted legislation directed to that end. Dr. Philip Ring read a paper on the "Sanitation of factories", as an outcome of which the Provincial government was requested to take steps to see that all industrial establishments were provided with modern sanitation The afternoon session was occupied with a symposium on "Poliomyelitis anterior", Dr. M. D. Morrison contributing his experiences of an epidemic; Dr. Clarence Miller a paper on "Diagnosis", and Professor Nicholls on the "Epidemiological aspects of the disease".

The following papers were also given: "Some military experiences of a former Medical Health Officer," by Major C. H. Morris, D.A.D.M.S., 6th Military Division; "The medical supervision of children," by Dr. H. A. Payzant, of Dartmouth; and, "Milk inspection and the inspector's duties," by Dr. G. Townsend, Department of Agriculture, New Glasgow.

At the evening session the president gave his address in which many matters of importance to the public health were discussed with much seriousness. Dr. DeWitt laid especial emphasis on the necessity of regarding venereal diseases as notifiable. Dr. J. J. Cameron, medical health officer of Antigonish, gave a thoughtful and suggestive paper on "Observations on the conservation of life".

Professor Fraser Harris, Dalhousie University, opened a discussion on the "Medical aspects of the tobacco habit". Most of the paper was a technical account of the physiological, pharmacological, and chemical effects of nicotine. Dr. Harris made it very clear that age and idiosyncracy were most important facts in regard to the effects of smoking. He discussed the modern theory of tolerance by the formation of a hepatic anti-body, and explained the physiological differences between small and large doses of nicotine, and between the occasional and the habitual use of tobacco. He by no means condemned the moderate use of tobacco on the part of adult men.

PRINCE EDWARD ISLAND MEDICAL SOCIETY

The annual meeting of the Prince Edward Island Medical Society was held in Summerside on Wednesday, July 11th, the sessions being held in the council chamber.

In the absence of the president, Dr. R. J. McDonald, of St. Peter's, the chair was occupied by Dr. Dewar, vice-president.

The members present were: Drs. A. McNeil, E. T. Tanton, J. Jardine, E. E. Sinclair, J. F. McNeill, of Summerside; McBride, of Tignish; Champion, of Tyne Valley; A. A. McDonald, of Souris; F. Jardine, of Kensington; McGuigan, of Emerald; Dewar, of Warburton; McMillan, Yeo, Conroy, Carruthers, of Charlottetown; Murchison, of Clyde River. Dr. J. Clarence Webster of Chicago University, and formerly of McGill University, was also present as a guest of the Society.

The reports of the different officers and committees were presented.

The election of officers resulted as follows: president, Dr. E. T. Tanton, Summerside; vice-presidents, Dr. McBride, Tignish; Dr. Murchison, Clyde Valley; Dr. McIntyre, Montague; secretary, Dr. Yeo, Charlottetown (reëlected); treasurer, Dr. McMillan, Charlottetown (reëlected); executive committee, Dr. McGuigan, Dr. Sinclair, Dr. Sullivan; auditors, Drs. Carruthers and F. Jardine.

The following medical council was elected: Drs. Carruthers, Warburton; Conroy, McMillan, Yeo, Dewar, Jenkins.

A most useful orthopædic apparatus was demonstrated by the inventors, Messrs. Thomas White and John Cameron, of Charlottetown. This device is intended to aid in the correction of deformities and weaknesses in the limbs. Its working was fully demonstrated and very highly commended by all the doctors present. They all had experience with similar devices manufactured elsewhere, and the unanimous opinion expressed was that this was the most complete and satisfactory they had seen. They complimented the inventors and urged them to give the device more publicity as its use would be of great benefit in very many cases. The device is already in use by a number of local people, and it has proved a great success.

Instructive and valuable papers were read by Drs. Dewar and McMillan, Charlottetown, and Dr. Alex. McNeill, Summerside.

Dr. Webster gave an excellent paper on "Infections of the kidneys and bladder". This paper was considered one of the best ever given before the society, and was very highly commented upon by those in attendance. Dr. Webster, was elected an honorary member of the Society in recognition of his useful paper and interesting address, and was given a cordial vote of thanks.

After the conclusion of the business the members were taken in automobiles to Cape Borden, which they enjoyed very much.

EDMONTON ACADEMY OF MEDICINE

A COMBINED meeting of the Edmonton Academy of Medicine and the Edmonton Dental Society took place on June 27th, on which occasion a paper on public health problems was read by Dr. Irving Bell. Dr. Bell was of the opinion that too little attention was paid to such matters and believed that the solution of these problems lay largely in education, and that as far as tuberculosis and venereal disease was concerned the best results would be obtained by a good workable public or social insurance bill. Dr. G. E. Hope suggested the establishment of a special provincial department by which all matters pertaining to public health should be directed. It was important, he thought, that the government should recognize the fact that every child brought up in the province should be given a liberal education, sound moral training, and such attention to its physical welfare as would bring it to maturity in possession of the fullest physical perfection possible in that child.

An interesting discussion followed the reading of these papers and the following resolution was passed unanimously:

"That in the opinion of this meeting we deem the matter of public health of the province of such pressing importance that immediate steps should be taken with the view of bringing such influence to bear upon the provincial government as will bring about the establishment of a department of public health, believing as we do, that only by the establishment of such a department can the urgent questions requiring attention be properly and adequately dealt with."

A committee was appointed to consider the question and the matter will be brought before the provincial government in the near future.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The eleventh annual meeting of the Society was held Friday evening March 7th, 1917, Dr. W. S. Morrow, president in the chair.

The programme for the evening consisted in an address by Professor J. J. R. Macleod of the Western Reserve University, Cleveland, Ohio, who took as his subject, "Physiology in the clinic." Professor Macleod divided his subject into two heads, that of the application of methods of experimental physiology and the application of methods of chemistry in physiology, and gave an extremely interesting discourse on the experimental physiological methods in the study of the heart's action, illustrated by charts and diagrams, and on the application of the newer methods of studying respiratory capacity and exchange.

The paper was discussed by Dr. Morrow, Professor Lloyd, Dr. Mason, Dr. Maude Abbott, Dr. Kaufmann, and Dr. Pennoyer. Professor Macleod replied.

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Annual Meeting, Calgary, 1917.

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Annual Meeting, 1917, Rimouski.

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ANÆSTHESIA FROM COMMERCIAL ETHER-ADMINISTRATION AND WHAT IT IS DUE TO

BY JAMES H. COTTON, M.A, M.D.

Toronto

EVER since William Long in 1842, and Crawford in 1846, used a sample of so-called ether for anæsthesia, the medical profession have believed that this anæsthesia obtained, was due to ethyl ether. They have continued to use ether (supplied by commercial firms), and you will most likely agree with the statement that the ether as so supplied is at present considered to be the safest and best anæsthetic known. No doubt, but that every anæsthetist has at times mentally criticized the anæsthetic powers of certain cans or makes of ether, and on account of there being no apparent chemical reason, has laid the blame at the door of the patient. But there is a reason, a most vital reason, (other than idiosyncrasy), and that is that ether, ethyl ether, with which we are so familiar, is not an anæsthetic, and the analgesia which comes from the administration of commercial ether, is not due to ether, but rather to the impurities occurring in it.

The research leading up to these radical conclusions was started in the spring of 1915, when Dr. McKicken, of the Toronto General Hospital staff, observed that certain cans of ether emitted an unusual odour, the cause of which was considered worth looking into. Through the kindness of Dr. C. K. Clarke, Professor Hunter, and Dr. Samuel Johnston, we were enabled to undertake the investigation of commercial ethers in the laboratories of pathological chemistry. The various states of the chemical part were carefully checked by clinical observation of the different derivatives

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Preliminary paper and demonstration as given before the Canadian Medical Association in June, 1917.

recovered, and it was slowly recognized that some were irritative, some anæsthetic, and some toxic.

IRRITATIVE IMPURITIES

Concerning impurities causing irritation, these may be anteior nasal and due to alcohols or acetones; or nasopharyngeal and bronchial due to aldehydes. Aldehydes irritate, causing mucous in an ether dilution of less than ·1 per cent. and it is possible that they may have something to do with ether pneumonia. The objectionable and often irritating odours of commercial ethers are due mainly to organic acids.

ANÆSTHETIC DERIVATIVES

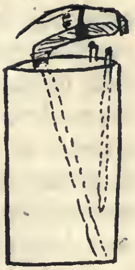
Let us now consider anæsthesia proper. The substances derived, may be divided into two classes:

First. Narcotics (producing peripheral congestion and drunkenness);

Second. Analgesics (producing loss of sensation and peripheral vaso-motor spasm).

Absolute di-ethyl ether as has already been stated will not anæsthetize. Its administration produces peripheral congestion, and drunkenness. Prolonged administration causes muscular tremor, shortness of breath with expiratory grunt, a terrible sensation of impending danger, and increased congestion. As much as twenty ounces have been administered to one patient with only this effect. If, however, a small amount of carbon-dioxide be present, the peripheral congestion is relieved, and the patient enters the natural anæsthetic and analgesic stages. In order, therefore, to obtain anæsthesia proper, we must have acting a narcotic such as di-ethyl ether, together with an analgesic such as carbon-dioxide.

The carbon-dioxide-absolute-ether anæsthesia constitutes a type of its own. In a previous paper, read at the Academy of Medicine in Toronto, I compared the action of absolute ether to that of nitrous oxide, with which the carbon-dioxide tension factor is also a necessity. The anæsthesia produced by this carbon-dioxide-ether method is very similar to that obtained from nitrous oxide, and the recovery almost as rapid. It is of interest that Hickman, as early as 1828, used carbon-dioxide alone as an analgesic. Of course, in cases suffering from certain metabolic disorders it is contraindicated.



In practice it was found convenient to administer the carbondioxide in solution with ether. In order to do this, a can capable of acting like a syphon-soda bottle was used (such as shown in the diagram), the carbon-dioxide being injected into the ether under high pressure.

So far, only one narcotic in commercial ether has been dealt with, namely, di-ethyl ether. Other narcotic substances occurring in commercial ether and acting the same as di-ethyl ether, are:

1. Alcohol—2 to 5 per cent.
2. Di-methyl ether (almost to saturation)
3. Methyl-ethyl ether (a trace)
4. Methy-propyl ether (a trace)?

} Only in ethers made from methylated alcohols.

These substances are all of a powerful narcotic aid. The last two—methyl-ethyl, and methyl-propyl ether—are very difficult to detect by odour as you will find by the samples, but the first two are easily differentiated.

But, of our ethers on the market, only a few contain carbon-dioxide in sufficient quantities to be of use, and therefore a further analgesic substance besides carbon-dioxide was looked for.

Absolute di-ethyl ether on being passed through a certain process was found to develop remarkable analgesic properties. With it almost major operations were performed with the patient still able to articulate clearly, without pain, and not at all sleepy. Its odour was found to be slightly sweeter than that of ordinary pure ether. It was the stage-acting of this substance that informed us there was something yet to learn concerning ether anæsthesia. The results obtained were so peculiar that men refused to believe them even on the word of our highest medical authorities unless they were witnesses. The symptoms were carefully studied in over two hundred cases. One case of special interest had administered to it in one month twenty-six such anæsthetics, as well as one nitrous oxide, one ether, and one ethyl-chloride. The duration of each administration was from fifteen to thirty minutes. With each of the old anæsthetics the patient was violently ill for some hours, but at no time after the analgesic ether was she to the slightest extent nauseated, even though she had had a meal immediately before. A description given by the patient of her sensations comes as near as possible to the truth:

"After a few breaths of a peculiar substance reminding me slightly of ether, but not so strong, I began to breathe heavily and quickly, and was conscious of a feeling of exhilaration and excitement all over me. My heart seemed to beat faster, and I felt myself growing hot, especially in the face. Next my legs seemed to go around in a circular motion, and the sensation would spread through my whole body, although at no time did I feel in the least dizzy. At this stage, the dressing began and I could feel water being poured upon my fingers and always knew whether it was hot or cold. The bandages often seemed to stick on being removed but there was no pain. Sometimes when they seemed to be probing or cutting there was a pricking sensation. Dr. Cleland at this period would usually ask if it hurt, and my answer was either "a little" or "not yet". If I said "a little", more of the analgesic seemed to be administered for at this point I usually went completely under its influence, and neither felt the dressing or knew in any way what was going on; although as a rule if one of the doctors spoke to the other, I heard it and made some comment, almost always remembering afterwards what had been said.

"The effect of coming out of this anæsthetic, I can compare to being awakened suddenly from sleep. I do not know how it appeared to onlookers, but I felt as if I regained consciousness instantly. I could at once see, feel, and hear in a perfectly natural manner, and my brain was quite clear. There was one marked peculiarity. For several minutes after becoming conscious, I talked steadily in a slow disjointed way, pronouncing every syllable separately; and I voiced any and every idea that came into my head, exactly as a child does. In fact I seemed to be on the intellectual level of a child of about ten years old, and I must have caused much amusement. I was quite aware of all this at the time but seemed powerless to do otherwise. I sometimes felt a slight oppression in breathing, due to the odour lingering in the room, and would ask the windows to be raised; but there was absolutely no discomfort in any way recovering consciousness, rather a feeling of pleasurable stimulation.

"Several times when only a little was given me, I felt the same sensation which I have described—rapid breathing, accelerated heart action, heat, and excitement, but there the effect stopped, and I remained conscious throughout the dressing, feeling quite normal, neither childish nor talkative, but having absolutely no pain."

Careful concentration and extraction of gases from this analgesia product showed the presence of a gas with similar properties to that of ethylene (CH_2-CH_2) (and another gas as yet not synthetized). This ethylene, as it was not present in the absolute ether base, must have developed in the process. Ethylene was then manufactured, and added to absolute ether, and a similar analgesic product to that already described was obtained. It is therefore reasonable to believe that ethylene is at least one of the analgesic substances for which we were looking. The method for manufacturing ethylene was through the interaction of alcohol and sulphuric acid. The gas was found to be more efficient if made at 175° (rather than 160° C.). All dangers of production of carbon-monoxide were eliminated by blood testing. In order that an ether-ethylene solution will demonstrate the described properties, the ether to which the ethylene is added must be absolute. The reason this secret of ether anæsthesia has not been discovered before, is that processes to obtain pure ether have never been before originated. Analyses of every ether on the market shows traces of ethylene, and it is its concentration upon which the anæsthetic power of a said ether depends. If, for instance, it is present in sufficient quantity in a sample of ether, it is possible to have the patient lose all sensation before being made drunk by the narcotic solvents. That is, it is now possible with this knowledge to control sensation as well as narcosis. The state of drunkenness which is necessary for a certain grade of analgesia depends entirely upon the condition of the circulation of the patient.

A word here on administration of the ether-ethylene solution may save many from failure. We all recognize in commercial ether anæsthesia, that there is an exciting stage occurring previous to unconsciousness. When, as it is now possible, we can control sensation through ethylene concentration, the question arises, are we going to run analgesia, this, or the other side of the excitation stage. It is very annoying indeed to both surgeon and anæsthetist to decide on a pure analgesia this side of the excitement stage, and not to use a sufficiently concentrated gas-ether. Under such circumstances, the patient may state that they are entirely without feeling, but when major stimulation comes, they may squirm. If now the anæsthetist, instead of using another sample in which the gas is more concentrated, makes the mistake of trying to continue his too dilute gas-ether, the patient is going to enter the ordinary ether excitement stages, while being operated on.

When the anæsthetic stage is deeper than the excitement stage occurring with concentrated gas-ether, the patient is a very long time recovering sensation and reflexes. It is therefore of use in tonsil work.

It is worth bearing in mind that ethylene produced by alcohol sulphuric interaction is not quite absolute and therefore it is possible in the gas-ether described to have yet other analgesic factors besides ethylene. I have already mentioned that in the process-analgesic-ether, there are other gases which develop besides ethylene.

SOME FACTS BEARING ON PRIMARY ANÆSTHESIA

Discussion of our adopted theories and classifications from a physiological standpoint leads us to the tormenting problem of what anæsthesia really is. Professor Alexander McPhedran drew our attention at the Academy of Medicine to the fact that analgesia may be brought about in some cases by making them take a number of deep rapid respirations. A peculiar coincidence probably relative to this, is that the so-called analgesic substances, carbon-dioxide, ethylene, and other ether gases, when present in an ether, cause rapid, deep respirations much sooner than would occur otherwise.

The following experiments was carried out on myself and then checked by ten other cases with similar results.

Thirty deep inspirations were rapidly taken. No change of sensation resulted except a fullness in the head. One half-hour was allowed to intervene, and six to eight full breaths of analgesic ether were then taken slowly. No change of sensation resulted. Fifteen deep rapid breaths of pure air were immediately taken. Almost a complete loss of peripheral sensation followed. Normal breathing restored, while further rapid breathing again reduced it. With myself I was able to eliminate sensation three times in succession with the one dose of analgesic ether by this rapid breathing method.

It is very difficult indeed to imagine an explanation for the above phenomenon, or even to state whether it is a nerve or circulation condition which makes it possible. In one case who had six anæsthetics of analgesic ether there happened to be a large area of granulation tissue exposed. The absolute analgesic stage would start about forty-five seconds after the beginning of deep rapid respirations. At exactly the same time as the loss of sensation occurred in each administration, the granulation tissue blanched but there was no apparent blanching in the skin, or lips, or change in the pulse rate. Unfortunately the blood pressure in this case was not followed. More circumstantial evidence of perhaps some importance is that at the beginning of an ordinary ether anæsthetic, the blood pressure usually rises, while later at the respiratory stimulation stage, it rapidly drops to some points below normal.

From the above facts it might be possible to theorize tentatively that ether anæsthesia is in part responsible to a relation to a certain condition of the peripheral circulation relative to the nerve endings.

POST OPERATIVE NAUSEA

Just a word as to toxic impurities relative to after-sickness. This phenomenon is from a practical standpoint the great disadvantage of ordinary ether anæsthesia.

In an earlier paper I drew attention to a poisonous gas, X derived by the superheating of ether, when in contact with a metal. A few weeks ago I was enabled to analyze it, and found it to be made up of aldehyde, carbon-dioxide, ethylene, carbon-monoxide and others. As all ether is superheated to a more or less degree, in soldering of the cans, there is a possibility of carbon-monoxide being present. In very small traces it will cause nausea and in an air dilution of less than ·15 per cent. it has caused death according to Dixon. Ether on being heated in a closed cylinder at 100°C. for one hour, will, on administration, produce excessive nausea. It is not known whether in this case there is a carbon-monoxide relation, for the research along this line has not been completed, on account of technical difficulties..

There is still another factor in after-sickness, and that is the narcotic group. Most people who take alcohol know that if they become very drunk they are going to suffer from after-sickness, and alcohol is a narcotic. Therefore it follows, that if in a certain sample of ether there is not a sufficient quantity of ethylene (or CO_2) we will, in order to induce analgesia, have to give an overdose of the narcotic solvents and post narcotic sickness must follow.

Before closing I wish to emphasize that this is only a preliminary paper and hardly an introduction to the different fields of research on anæsthesia which have been opened up.

DEMONSTRATION

June 14th, 1917.
Royal Victoria Hospital, Montreal.
Surgeons:
Dr. Archibald,
Dr. Garrow,
Colonel Keenan.

8.45 a.m.

Case 1.

Cat: Age 9 months.

Administered sixty drops of ether (absolute) (saturated with ethylene). Time—two and a half minutes; cat relieved of all sensation, yet capable of walking.

8.55 a.m.

Case 2.

Chinaman: Middle-aged.

Anæsthetic: Absolute ether, carbon-dioxide.

Induction to analgesia three and a half minutes.

Operation: Infected upper arm. Eight incisions were made over biceps. Patient free from sensation but not at all unconscious.

Operation time: Ten minutes.

9.10 a.m.

Case 3.

Cat: Same animal as before.

Administered three ounces absolute ether. Animal became hyperæsthetic. Slightest touch would make it yell. Then a struggling stage started with shortness of breath and expiratory meouw. A further half-ounce caused a short gaspy respiration but no analgesia.

9.20 a.m.

Case 4.

Englishman: Middle-aged.

Anæsthetic: Absolute ether—ethylene.

Induction to analgesia—four minutes.

Operation: Resection splintered bone from elbow. Patient capable of carrying on active conversation and yet was entirely free from sensation.

Time of operation: Fifteen minutes.

CONCLUSIONS

1. Absolute gas-free ethyl-ether is not an anæsthetic.
2. It acts only:
    - (a) As a vehicle for analgesic gases:
        Carbon-dioxide
        Ethylene
        Other gases
    - (b) As a narcotic stimulant.

3. Other narcotics occurring in commercial ether, and acting similar to ethyl ether, are:
    - Di-methyl-ether
    - Methyl-ethyl ether
    - Methyl-propyl ether
    - Alcohol

    Only in ethers made from methylated alcohols.
4. Ether, on being sufficiently superheated in contact with a metal gives rise to carbon-monoxide and other gases.
5. After-sickness from commercial ether administration, for surgery, may be from:
    - (a) Narcotic poisoning (excessive administration of narcotic solvents).
    - (b) Carbon-monoxide poisoning.
    - (c) Surgical shock.
6. Irritating substances occurring in commercial ether are:
    - (a) Alcohols and acetones, causing anterior nasal irritation.
    - (b) Aldehydes, causing naso pharyngeal and bronchial irritation.
    - (c) Organic acids, producing bad odours.
7. Respiration rate is in part a factor in early analgesia.

SHRAPNEL BALLS

THEIR *X*-RAY CHARACTERISTICS, COMPARED WITH BULLETS AND OTHER FOREIGN BODIES

By A. H. Pirie, M.D.

Captain C.A.M.C.

Radiologist No. 3 Canadian General Hospital (McGill)

THE following notes are based on the findings from 10,000 *x*-ray plates made in about a year at a hospital in France where the writer was in charge of the *x*-ray department. During that time we made 241 plates of shrapnel balls and 242 plates of bullets. Much more frequently we found pieces of casing of shells, bombs, grenades, etc., and these were shown on 3,846 plates.

The complete analysis of these 10,000 plates is as follows:

Fractures with foreign bodies present	4·25	per cent.
Fractures without foreign bodies present	11·77	"
Bullets	2·42	"
Shrapnel balls	2·41	"
Other foreign bodies	38·46	"
Lesions of the chest	1·87	"
Negative findings	29·93	"
Unclassified in the above	5·88	"
Total	10,000	

The "unclassified 5·88 per cent." is made up from such things as exostosis, stone in kidney, stomach plates, etc.

Shrapnel balls may be found entire without any deformity, and every stage of deformity may be met with till an appearance is obtained as if the ball had exploded into small particles. There is one entrance wound only, if the ball is entire, and the wound is rather characteristic.

If the ball has struck an external object before striking the patient, it may break into two or more pieces, and the wounds of entrance will then be multiple. When the ball passes into the body it remains there. Our experience has been that no shrapnel

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Read before the *x*-Ray Section at the forty-eighth annual meeting of the Canadian Medical Association, June 14th, 1917.

ball has passed through the body and come out at the other side the way a bullet so frequently does. When a shrapnel ball meets a bone it becomes deformed according to the resistance offered by the bone, and some of the lead is left behind on or near the bone.

Shrapnel balls of iron have been found but they are more commonly of lead. Three different sizes of shrapnel balls have been found. There are two bones only which in our experience a shrapnell ball cannot penetrate, viz., the femur in its shaft and the vault of the skull. We have found several cases in which the femur has received a direct hit and the ball has broken into two or more pieces and just roughened the surface of the bone.

In one case a direct hit on the vault of the skull fractured the outer table and depressed the inner table, and the ball remained in the bone. We have had no case in which a shrapnel ball entered the brain.

The fibula and the bones of the forearm are always fractured by a direct hit but the tibia may escape, as may also the humerus, but both humerus and tibia may be broken. The small bones of the hand and foot, the ribs and the vertebræ are constantly fractured by a direct hit. The body of a vertebra may receive and lodge a shrapnell ball and the *x*-ray may show very little damage to the bone. When a shrapnel ball travels through the body without striking a bone it is stopped by the skin far from its point of entry and can be felt under the skin with the finger. The patient usually discovers it himself before it is confirmed by *x*-rays.

It is sometimes difficult to distinguish a completely deformed shrapnel ball from a piece of iron casing of a shell, but the general rounded appearance of the lead and the want of serrated edges help to distinguish the two. When there are dust-like particles present, caused by the impact of the ball on a bone, there is no difficulty in diagnosing the deformed ball as a shrapnel ball.

The diagnosis of lead from iron by *x*-rays becomes important where foreign bodies are removed by the help of an electro-magnet. The iron casing of shells and German bullets vibrate, but English bullets and the casing of Mills bombs do not vibrate, when an electro-magnet supplied with alternating current is brought near to them. The finger placed on the surface of the skin can detect this vibration and when it is too feeble to be felt, it can be heard by means of a curved wooden stethoscope.

The following characteristics help to distinguish a broken up shrapnel ball, a broken up bullet, and multiple foreign bodies of iron:

Table Showing the Characteristics of

Shrapnel ball broken up	*Bullet broken up*	*Multiple Iron Foreign bodies*
The edges are rounded or slightly ragged and not at all or very slightly serrated;	The larger pieces are very ragged;	The edges are serrated like broken cast iron;
One piece may show part of the round outline of the ball;	One piece may show part of the form of the bullet;	Fragments not so numerous as a broken up ball or bullet;
Minute fragments like dust along the track of the ball.	Minute fragments like dust.	When numerous fragments are present they are more widely separated and there are many separate wounds of entry, absence of dust-like particles.

The contrast between the damage done by a bullet, and that done by a shrapnel ball is very marked, when a direct hit is made on the femur or on the skull. A bullet hitting the femur splinters the bone, as it does a glass bottle. At the same time the bullet breaks into pieces, and its fragments and those of the femur are scattered through the limb, or blown out through the skin as if an explosion had taken place. This gives rise to the idea that an "explosive bullet" had been used, but the explosion is not due to any explosive like cordite inside the bullet but to the manner in which it broke itself and the bone. In such a case the entrance wound is very small and the exit wound very large, whereas if the bullet had not struck the bone it would have passed through and have done very little damage provided it missed large vessels and nerves. A spent bullet makes a larger exit wound than one with its initial velocity, as the latter keeps its course with its point leading, whereas a spent one turns round in the tissues and may emerge with its blunt end first. It may be difficult to say which is the entrance and which the exit wound when the bullet has its high initial velocity.

Just as the entrance through the skin may be very small so the entrance wound into a bone may be quite small. In one case a bullet which penetrated into the femur instead of smashing the femur, changed its direction after entering the bone and ran up the medulla, stopping in the cancellous bone near the great trochanter. This seems to show that the great splintering of a femur when done by a bullet takes place as the bullet emerges and not as it enters the bone.

When a bullet goes through cancellous bone like the head of the femur it may punch a clean hole and cause very little fracturing but one of the worst fractures is caused when it hits the dense bone of the shaft near its junction with the cancellous bone. In this case the splinters of dense bone are driven into and split up the cancellous bone to such an extent that amputation becomes necessary.

When a bullet travels through the soft tissues without striking bone it usually lies with its pointed end directed towards the point of entry, though not pointing directly at the wound. This is a mechanical effect produced by the shape and balance of the bullet.

Quite a variety of foreign bodies have been found in our series, viz., iron, nickel, lead, brass, pewter, copper, aluminium, oyster shell, chalk, stone, clothing, cartridges, foresight and backsight of a rifle, needles, barbed wire, buckles, screws, pieces of machinery. Gas frequently forms from the dirt carried in with a foreign body and is very easily seen in an *x*-ray plate and even on the fluorescent screen.

ANALYSIS OF A SERIES OF 10,000 PLATES SHOWING BULLETS, SHRAPNEL BALLS, AND FOREIGN BODIES ALSO NEGATIVE FINDINGS

Region	*Shrapnel Balls*	*Bullets*	*Foreign Bodies*	*Negative Findings*
Abdomen	7	6	63	44
Ankle	8	1	93	303
Arm	9	10	300	247
Back	24	26	136	149
Buttock	20	13	320	162
Chest	13	41	302	194
Knee	28	11	307	284
Eye	0	0	41	10
Elbow	9	3	112	81
Forearm	4	4	218	89
Hand	5	6	194	164
Foot	5	6	115	186
Head	8	10	362	239
Leg	16	24	325	251
Neck	7	13	94	64
Pelvis	7	8	31	55
Shoulder	31	24	212	203
Thigh	33	25	608	215
Wrist	1	2	54	45
	241	242	5846	2993

THE RADICAL CURE OF INGUINAL HERNIA

By F. N. G. Starr, M.B. (Tor.)

ONE naturally hesitates to describe anything new in the radical cure of hernia, when the Bassini, the Halsted, and the Kocher, with their varied modifications, hold such a high place in the esteem of surgeons generally. The operation that I propose to describe, the technique of which I have been developing over a considerable period, might well be described as a modification, or rather an amplification, of the Kocher invagination method, but it is a vast improvement. It means not only the obliteration of the sac, but the formation of a bud opposite the internal ring instead of a funnel mouth, with no transplanting of, or other traumatism of the cord, and with a solid abdominal wall.

An incision is made beginning close to the anterior spine of the ilium one inch above Poupart's ligament and paralleling it, and is carried to a point opposite the spine of the pubes. The skin, superficial fascia, and the fascia of Scarpa are divided, when the aponeurosis of the external oblique is exposed. A nick is made in this with the knife, then the point of the scissors is introduced and the aponeurosis is cut toward the outer end of the skin incision. The index finger is then introduced into the opened inguinal canal to the external ring, and the incision in the aponeurosis is carried down to, but *not* through, the external ring. With the points of a pair of Mayo's dissecting scissors the fibres of the cremaster muscle are separated, then with a pair of forceps the sac is lifted into the wound. By means of a gauze wipe this is readily cleared up to the internal ring, and, if one is careful in separating the external spermatic fascia, this is done with no traumatism of the cord whatever. The sac when freed is opened to make certain that no contents are adherent. The edge of the opening of the sac is now caught in a pair of long, curved, blunt pointed forceps and these are carried through the sac into the abdominal cavity, keeping close to the abdominal wall, and pushed against the wall external to and above the internal ring. An assistant then makes a "nick" not more than a quarter of an inch long into the aponeurosis just

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Read before the Surgical Section at the meeting of the Canadian Medical Association, June 14th, 1917.

above the cut edge of the aponeurosis, and the fundus of the sac is pushed through. A pair of forceps is then fastened to this and the curved forceps withdrawn. The invaginated sac is now pulled out as far as it will come. A piece of No. 2 chromic gut threaded double on a long, curved, round needle now catches the edges of this tiny hole in the aponeurosis and also passes through the neck of the sac. This is again carried back through the edges, and again through the sac, when a half knot is tied and the ends of the suture grasped in a pair of forceps. The needle now passes through the original cut edge of the aponeurosis, catches the internal oblique and then Poupart's ligament; this continuous suture is repeated until finally the conjoined tendon is caught, when, with the finger in the external ring, its external pillar is invaginated into the wound and caught with the part of the suture that has passed through the conjoined tendon. Before this is pulled tight the needle passes through the last loop, and thus that first row of the continuous suture is locked. The lower cut edge of the aponeurosis is now sutured to the face of the aponeurosis above and continued back to the original point of starting, thus overlapping the first line completely. The original knot is now completed. One strand of the double strand of gut is now cut and runs back subcutaneously as well as through the fascia of Scarpa, care being taken to surround with the suture each pair of forceps on a vessel so that when this suture is completed, there is no bleeding or even oozing. The skin edges are then united with horsehair. Thus one has the sac dealt with, the canal narrowed, the internal oblique sewn to Poupart's ligament, and the aponeurosis sutured to itself, and the wound closed with one continuous suture, and only one knot in the wound.

To my mind the all important thing in the cure of hernia is the complete obliteration of the sac, and I know of no better method than by invagination. Many times in children I have depended upon this alone and the results have been gratifying.

By ligaturing the neck of the sac, or by sewing the neck of the sac, one leaves a funnel-like process opposite the internal ring. This, together with the intra-abdominal pressure directed to that point, can more readily force the formation of a new sac than when one has a "hump" where the intra-abdominal force has been in the habit of striking.

Before leaving the subject of the cure of hernia, I desire to call attention to a method of attack from within the abdomen when one is operating for other conditions and it is desired to repair a hernia at the one sitting. A pair of curved forceps may be introduced through the internal ring into the sac and the wall of the sac grasped and gradually pulled up into the abdomen until the fundus of the sac becomes completely invaginated. Then the suture with which it is intended to close the abdomen is passed through the neck of the sac and tied to the parietal peritoneum. The suture is then continued along the sac, suturing it to the parietal peritoneum, so that by the time the sac is fully dealt with, the suture has reached the cut edges of the abdominal incision and is then carried along, closing the peritoneum. This makes a perfectly satisfactory cure of the hernia, is easily and quickly done, besides saving a second incision. I have records of seven cases that have stood the test for two years and more, and I therefore have no hesitation in commending it for your consideration.

It seems to me that some day it may be the operation of election. One sees so many cases, especially in fat subjects, where recurrence has taken place, and where one hesitates to re-operate through scar tissue, that I have been prone to open the abdomen and operate from within.

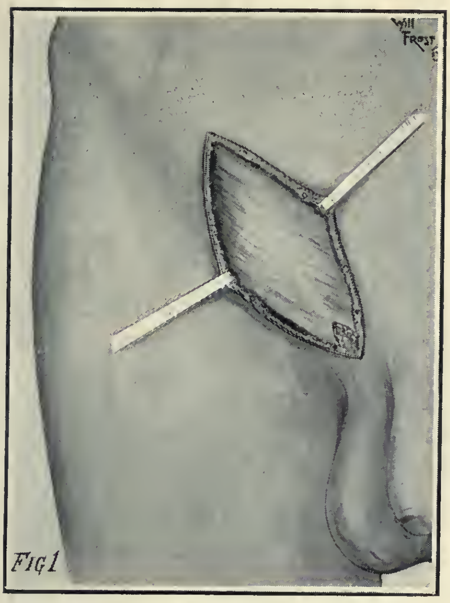


FIG 1

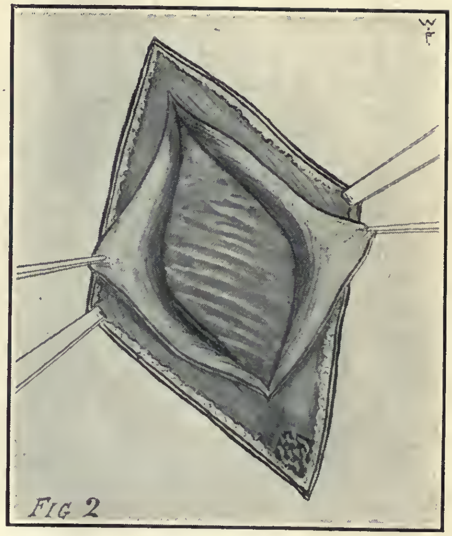


FIG 2

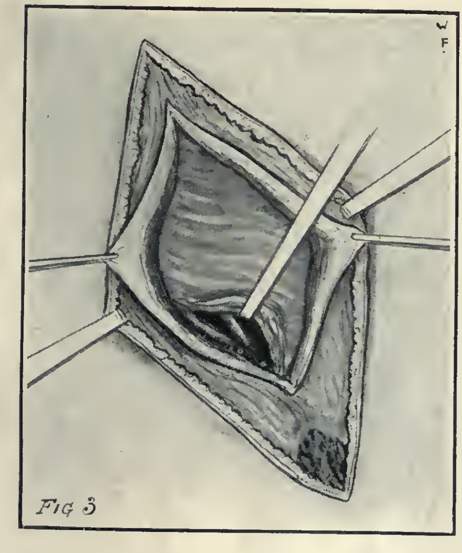


FIG 3

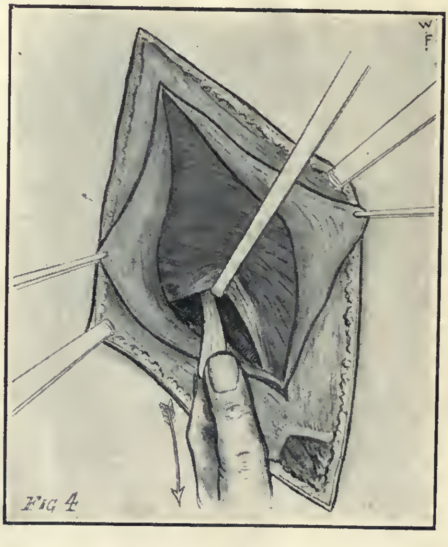
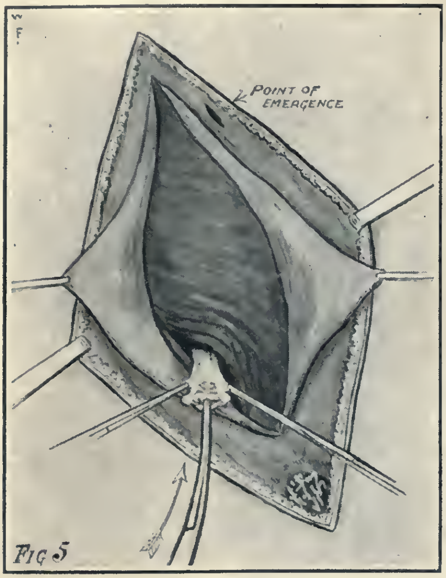
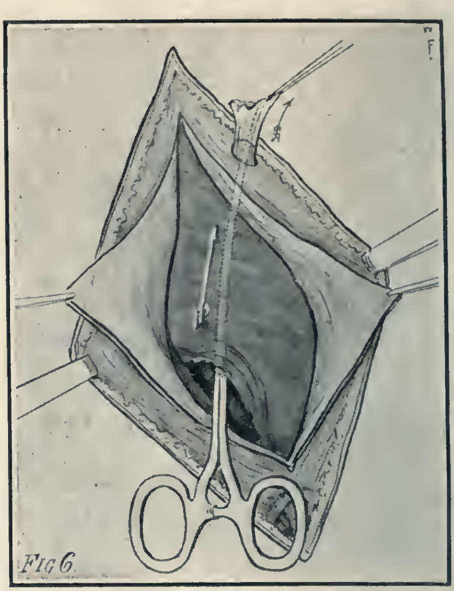
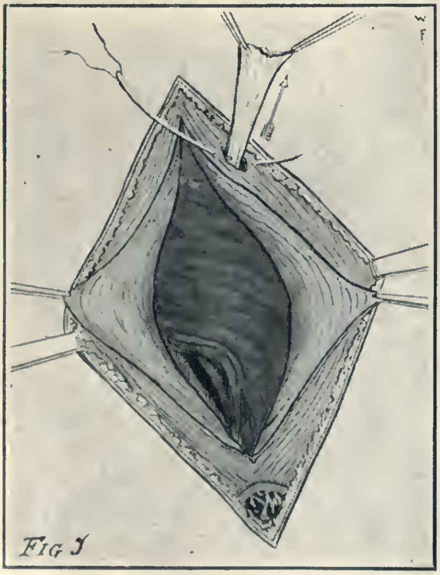


FIG 4

FIG. 1.—Skin incision exposing external oblique and external ring.
FIG. 2.—Incision of external oblique exposing internal oblique and Poupart's ligament.
FIG. 3.—Separating fibres of cremaster.
FIG. 4.—The sac appearing from between the fibres of the cremaster.







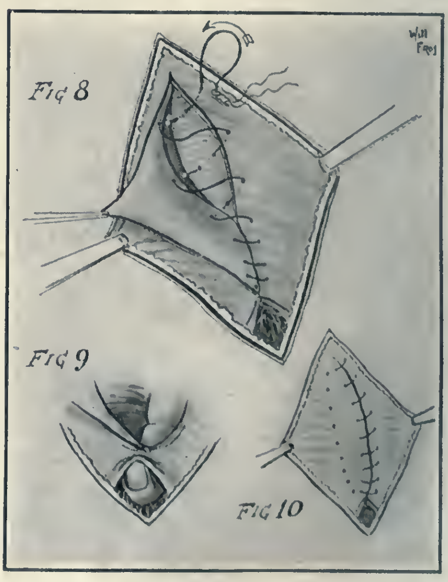


FIG. 5.—The sac opened and the fundus caught in forceps.

FIG. 6.—The fundus invaginated within sac, carried through canal, and internal ring to point of emergence.

FIG. 7.—The sac turned inside out and being sutured to small opening in aponeurosis.

FIG. 8.—This suture continued, catching upper cut edge of aponeurosis, internal oblique, and suturing to Poupart's ligament.

FIG. 9.—Turning outer pillar of external ring into wound to catch with suture through conjoined tendon.

FIG. 10.—The suture of lower cut edge of the aponeurosis to face of aponeurosis above first row of sutures.

AN UNUSUAL FORM OF SUBCONJUNCTIVAL CYST

By J. W. Stirling, M.D.

Professor of Ophthalmology, McGill University; Surgeon Oculist, Royal Victoria Hospital, Montreal

THE condition which I report to you to-day is certainly a rare one, and in my search of the literature on the subject, I find no exactly similar case.

The patient, A. R., was an elderly gentleman of seventy-six years of age. He came to me complaining of a swelling on the surface of the left eyeball, which he first noticed five months previously and which was slowly increasing in size. There was no history of any injury to this eye, the only thing being some slight recurrent subconjunctival hæmorrhages six years antecedent.

Examination of the eye revealed a large oval semi-opaque swelling starting two millimetres from the outer edge of the cornea, opposite the palpebral fissure and extending outward five millimetres, the vertical diameter being three millimetres in extent. On palpation, it felt resilient with some slight fluctuation. The conjunctiva was adherent to the apex of the swelling but sloped away from it at its base. The growth appeared also to be fixed to the subjacent sclera. There was but very slight conjunctival injection and no tenderness.

On attempting to dissect off the conjunctiva the cyst was perforated near its apex, and clear serous fluid was evacuated, together with seven small opaque bead-shaped bodies varying in size from a small pin head to a split pea. I carefully dissected out the cyst and gave it and its contents to Dr. Oertel, to whom I have to express my thanks for his pathological and microscopical report of the same, which is as follows: The cyst walls consist almost entirely of well formed, large and medium-sized squamous epithelial cells with a good number of epithelial pearls (see drawing). The cells rest in close proximity, forming thick layers, giving the tissue somewhat the appearance of epidermis. From

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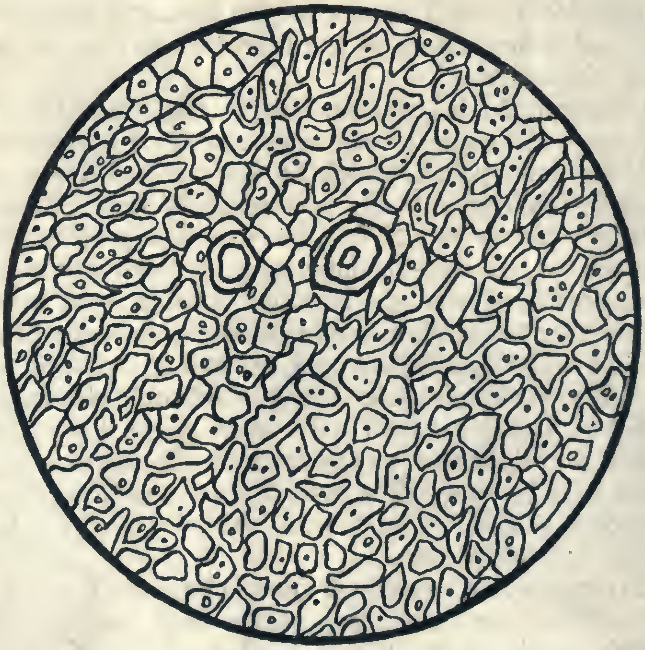
these findings it may be concluded that these cysts are of epidermal origin and that they owe their development to proliferation of the lining squamous epithelium, central softening and cystic degeneration, with secondary papillary epithelial projection into the lumen of the mother cyst, this giving rise in similar manner to daughter cysts. The process seems, therefore, comparable in some degree to that of cystitis cystica of the bladder.

The condition is an uncommon one. Cysts, except as traumatic implantation cysts following the imbedding of a foreign body such as an eyelash, epithelium from the conjunctiva or as a lymphangiectasis, cannot occur in the ocular conjunctiva, there being no glands present. Cysts are not uncommon in the palpebral conjunctiva — glands being present.



Uhthoff describes three cases in the *Berliner Klinische Wochenschrift* for 1879 due to trauma but no secondary small cysts were present. One case followed an advancement of the external rectus—five weeks after the operation; the cyst was adherent to the sclera and partly covered by the advanced rectus tendon in its upper third. Contents were clear serous fluid—cell wall was irregular fibrous formation lined with a single layer of nucleated squamous epithelium. The second case followed a blow with stick—dividing upper lid edge and conjunctiva bulbi—five weeks after healing, a cyst developed due to implantation of five cilia. The third case was due to an insect flying into the eye; four days later a clear cyst size of a pea developed—dissected out. The structure of the cyst walls in the two foregoing cases was indistinctly fibrous lined with flat epithelium.

Uhthoff at the same time considered the cysts as due to dilated lymphatics.

Cysts of traumatic origin have their situation in the subconjunctival tissue; inflammatory reaction in their neighbourhood binds them down to the sclera and superjacent conjunctiva; hence they cannot be moved on pressure, whereas lymphangiectasis can be moved about with the conjunctiva and are small and bead shaped.

Although my case gave no history of any injury, I am sure it was of traumatic origin following the implantation of some foreign body, although none was found.

A SPECIAL meeting of the St. Thomas Medical Society and the Elgin County Medical Association was held at Inverarie Heights, Port Stanley, on July 26th, Dr. G. Shannon in the chair. A paper on the "Diagnosis and treatment of gall stones and gall bladder troubles," read by Dr. H. A. McCallum, of London, Ontario, was listened to with great interest, as was also a paper entitled "Pneumonia complicating whooping cough," by Dr. G. E. Thompson, of Springfield. Dr. G. A. Brodie, of Woodstock, addressed the meeting on questions of medical interest in connexion with the work of the Ontario Medical Association, and a resolution was passed to the effect that the Elgin County Medical Association become affiliated with the provincial association. About forty doctors were in attendance.

COMPLICATIONS OF MASTOIDITIS

By D. H. Ballon, B.A., M.D.

Clinical Assistant in Oto-Laryngology, Royal Victoria Hospital, Montreal

IN this paper I intend treating very briefly the intracranial complications and the facial paralysis following otitic inflammations.

By way of illustration I have chosen six successful cases operated on by me at the Royal Victoria Hospital as demonstrating some of the complications. These cases include two of lateral sinus thrombosis, two of facial paralysis, a labyrinthine fistula, and a case of cholesteatoma.

Anatomy. Just a word about the anatomy in order to understand clearly the various directions in which pus can travel in the mastoid. We must consider the mastoid as the posterior part of the tympanic cavity. Whenever we have even a catarrhal inflammation of the middle ear, we have a catarrhal inflammation of the mastoid, as can easily be corroborated by skiagrams. For practical purposes the mastoid and middle ear are considered as constructed like a box. If pus perforates the roof we have an extradural abscess, or as a later development the cerebral-temperosphenoidal-abscess. On the floor is the jugular bulb; on the posterior wall is the lateral sinus and the cerebellum, which can give rise to perisinus abscess, lateral sinus thrombosis, extradural and cerebellar abscess. The anterior wall has the Eustachian tube along which nearly all the middle ear and mastoid infections travel; and also the carotid canal. The outer wall is the drum and the inner wall the labyrinth, with all its possibilities of labyrinthitis and meningitis. Running through the middle we have the facial nerve. By most of these paths bacteria can enter the cranial cavity producing a localized or diffuse, serous or purulent, pachy or leptomeningitis.

Read before the regular meeting of the Montreal Medico-Chirurgical Society, November 17th, 1917.

Received for publication, June 1st, 1917.

EXTRADURAL ABSCESS

An extradural abscess is theoretically a circumscribed collection of pus between the dural covering of the brain and the plate of bone which separates it from the mastoid, but practically we usually find an exposed dura without any intervening bone.

It is generally produced by a virulent infection, in a pneumatic mastoid with a thin plate of bone separating it from the cranial cavity, or else pus exists under pressure in a mastoid with a thick cortex and small pneumatic spaces.

The symptoms are indefinite; they are generally those of a severe uncomplicated mastoiditis. The diagnosis is made at the operation, although we may suspect it. The most common site is between the tegmen antri and the dura covering the temporal lobe. The dura may be normal or covered with granulations thus representing a localized pachymeningitis. The prognosis is favourable where there is adequate surgical drainage by a mastoid operation.

PERISINUS ABSCESS

A perisinus abscess is an extradural abscess. There are no characteristic symptoms. Usually it is accidentally discovered during a mastoid operation. It is the precursor of lateral sinus thrombosis. The prognosis is favourable if there are no septic symptoms, if the lateral sinus is freely exposed and the pus evacuated. The granulations on the dura should be left absolutely undisturbed, as it is nature's method of repair.

THROMBOSIS OF LATERAL SINUS

Sinus thrombosis is usually the result of a chronic suppurating mastoiditis. Of the organisms the streptococcus is the greatest offender. Frequently there is an extension into the sinus of the original septic focus in the mastoid; and the thrombus may extend downwards to the bulb and jugular vein; backwards toward the torcular; inwards along the superior and inferior petrosal sinuses; outwards along the emissary vein.

The thrombus may be complete, or incomplete, that is a mural thrombus not obstructing the lumen, and producing no symptoms. If the clot is sterile it may become organized into fibrous tissue and give rise to no symptoms; but as the clot is usually infected it leads to suppuration, disintegration, and the septic material is thrown into the general circulation.

Symptoms. The first definite symptoms are very characteristic. There is a rigor lasting five to ten minutes, and then a sudden and marked rise of temperature from normal to anywhere up to 105° and in a few hours the temperature drops down to normal and the patient perspires freely. The pulse rate is proportionately increased according to the temperature. Two of my cases while in the hospital had a rigor lasting one half hour. During the afebrile period the patient feels comparatively comfortable. This cycle of septic phenomena which is the basis of diagnosis in the majority of cases is usually repeated every twenty-four to forty-eight hours. The sharp rise of temperature marks the entrance into the blood stream of the septic masses from the disintegrating thrombus, and the rapid fall to the normal indicates their final elimination. Of course there is a previous aural history, generally a chronic intermittent painless purulent discharge, and then a sudden lighting up of the symptoms initiated by some acute infection especially influenza. In these cases we get evidence of retention by the decrease or sudden complete cessation of the discharge, while pain is complained of or increases. An acute exacerbation of the symptoms in any suppurating otitis media is always a danger signal of a possible intracranial complication. There is headache and vomiting. Optic neuritis may be present but its absence is without significance. The leucocytes do no usually exceed twenty thousand. Libman and others have shown streptococci in blood cultures; but the presence of streptococcus in the blood, without clinical evidence, is not sufficient to diagnose sinus thrombosis or to justify opening the sinus. You may get it in uncomplicated suppurative mastoiditis (Duel and Wright), in severe tonsilitis, endocarditis, pneumonia, etc. The physical signs are often completely absent. The aural findings may be quite indefinite. The *x*-ray offers no assistance in the diagnosis of a thrombus. There may be œdema over the mastoid, tenderness over the mastoid emissary vein and along the course of the jugular vein, and even a moderate induration along the course of an infected vein is not uncommon. The sinus wall may be thickened and covered with granulations. Granulations do not form a healthy dura. In the latter stage the sinus may be gangrenous with a definite thrombus palpable, and pulsations absent or very faint, though I have seen quite marked pulsations present with a definite thrombus.

Prognosis and Treatment. The prognosis is extremely unfavourable unless relieved by operation. The treatment consists in removing all diseased bone in contact with the sinus in all directions, until the bone is perfectly healthy, and until apparently healthy sinus is reached in both directions—that is, towards the torcular and the jugular vein. Now if the thrombus can be removed and free bleeding obtained at both ends, the jugular vein need not be ligated. If the thrombus has spread from the lateral sinus to the jugular bulb or jugular vein, ligate or resect jugular vein. It cuts off the general circulation and prevents further systemic poisoning. If one is sure of a thrombus and there are metastasis in the joints, ligate the jugular vein first, and then do the mastoid operation.

This form of treatment has been productive of very good results and has reduced the mortality considerably.

BRAIN ABSCESS

The great majority of brain abscesses are secondary to chronic middle ear or mastoid disease. They are usually single, situated in the temperosphenoidal lobe, and twice as frequent as cerebellar abscesses. First there is produced an external abscess and then the dura being in constant contact with the pus undergoes necrosis at some point and thus establishes a direct pathway of infection to the contiguous cerebral structure. The size varies from a pea to such a large size as to displace the brain, thus explaining the lack of symptoms in certain cases.

Symptoms. At the outset we may have symptoms of a localized meningitis—headache, vomiting, and high temperature. Then later the general symptoms of increased intracranial pressure—more or less constant headache of indefinite location, worse at night. The temperature is normal or subnormal and the pulse is slow, getting slower as the abscess increases in size—may be forty to the minute—when the abscess is successfully evacuated the pulse rate rises quickly. The mental dullness is characteristic. The changes in the eye grounds, choked disc, papillitis, optic neuritis may be present with any intracranial disease causing increased pressure,—brain tumour, abscess, meningitis. There are usually no eye changes in temperosphenoidal abscess and in the majority of cerebellar abscesses, but these are common in otitic meningitis, and in slow growing brain tumours. Of the focal symptoms, partial word-deafness is the commonest form of sensory aphasia met with in otitic brain abscess. Motor aphasia is rare. A large temperosphenoidal abscess will cause a pronounced localized contralateral paralysis in face, arm, and hand from transmitted pressure on the motor area, while pressure on the internal capsule will involve chiefly the lower extremity.

Unless relieved surgically the disease is fatal.

CEREBELLAR ABSCESS

The general symptoms are like those in temperosphenoidal abscess, the subnormal temperature, and slow pulse, though the headache is more severe and localized to the side of the lesion, and vomiting and ocular changes are more frequent. There is rapid emaciation due to the disturbance of some centre influencing tissue metabolism. Focal symptoms may be absent but when present there is no intracranial lesion in which the clinical picture is more definitely characteristic.

1. There is a central nystagmus differing from the labyrinthine in that it is more marked toward the side of the lesion and becomes more pronounced with the progress of the disease.
2. The subjective vertigo is quite independent of the nystagmus.
3. The cerebellar ataxia is towards the side of the lesion uninfluenced by the nystagmus.
4. The unilateral incoördinating ataxia in the arm and hand also corresponds to the side of the lesion as shown in the finger test.
5. Babinski described a symptom which he called adiadokokinesis. Rotate both wrists as quickly as possible. The rotations are performed very slowly and with apparent labour on the side corresponding to the lesion.
6. Loss of sense of position.
7. Barany's pointing test is a valuable asset in the diagnosis of cerebellar lesions. He has localized certain definite centres in the cerebellar cortex which control the movements of each particular joint or its controlling group of muscles. Normally these centres act harmoniously and coördinate the movements of the various joints. But if a cerebellar abscess has destroyed let us say the centre that controls the movements of the right arm, inwards, then there will be a spontaneous outward deviation of the right arm, and experimentally it will fail to respond to the vestibular irritation; whereas the left arm will give the normal reactions.

The differential diagnosis between cerebellar abscess and acute diffuse suppurative labyrinthitis is very important.

1. In labyrinthitis the nystagmus is more marked toward the sound ear and disappears in two or three weeks while in cerebellar

abscess the nystagmus is stronger towards the diseased ear and becomes more marked with the progress of the disease.

2. In labyrinthitis there is a deviation in both arms opposite to the quick component; in cerebellar abscess there is an error in the hand or arm of the same side as the cerebellar lesion.

3. In labyrinthitis the caloric reaction is absent and the hearing in the diseased ear is absolutely lost. While in cerebellar abscess they are both normal.

4. Incoördination ataxia and adiadokokinesis are absent in labryinthitis but very prominent in cerebellar abscess.

5. Temperature elevated and pulse varies with temperature in labyrinthitis; in cerebellar abscess the temperature is subnormal, and pulse abnormally slow.

Otitic Meningitis

In circumscribed meningitis the dura is congested, thickened, or covered with granulations. It is a simple lesion frequently discovered only during the mastoid operation. The best treatment is to remove all diseased bone in contact with the dura so that healthy dura is present; sometimes this is all that is required. Without surgical treatment the patient's life is jeopardized. In serous meningitis if the symptoms are not relieved, make two or more incisions in the dura extending to the subarachnoid space or into the cerebral cortex to relieve the pressure of the advancing œdema. No drains should be introduced. In circumscribed purulent meningitis incise the dura promptly, while in diffuse purulent meningitis free and multiple incisions should be tried. Diffuse suppurative meningitis is not curable; if cured it was a serous meningitis. Cushing has recommended intraspinal injections of urotropin, gr. 45, disolved in 30 c.c. sterile saline, once or twice daily. The results are uncertain. Lumbar puncture is used to relieve tension.

Labyrinth Fistula or Circumscribed Labyrinthitis

A labyrinth fistula is usually due to the defect in the bony wall of the semicircular canals as a result of chronic suppurative otitis media and mastoiditis and is most commonly found in the horizontal canal. The onset is usually sudden and may pass off in a short time. The patient suffers from labyrinthine symptoms of vertigo, disturbance of equilibrium, nausea and vomiting, and nystagmus. There may be more or less loss of hearing and subjective noises. There is usually a spontaneous nystagmus to either side or both sides. The caloric reaction is normal and fistula symptom is present. The treatment is a radical mastoid operation. Under no circumstance should the inner ear be operated on, for then we break down nature's barrier and may extend the disease to the cranial cavity. In a suppurative labyrinthitis where the hearing is gone and the caloric test is absent a labyrinth operation is indicated.

CHOLESTEATOMA

In chronic suppurative otitis media there is a migration of the epithelium of the auditory canal and drum through marginal or large central perforations into the tympanic cavity. It is seen most often in Shrapnell's membrane and it extends by way of the aditus to the mastoid antrum. Here it is deposited in rather compact concentric masses, which grow larger and larger and are very destructive. They absorb the surrounding bone, exposing the brain, lateral sinus, and labyrinth, producing meningitis, sinus thrombosis labyrinthitis or brain abscess. Cholesteatoma is of a pearly grey colour, very offensive, and made up of cholesterin crystals and broken epithelial cells. The treatment is radical mastoid operation.

OTITIC FACIAL PARALYSIS

In this paper we are only considering facial paralysis which is caused by some acute middle ear or mastoid disease. The condition is by no means uncommon and is found more in children than in adults. In two of my cases it occurred in an infant of six months and a child of one year. Influenza, scarlet fever, and severe infections are the most frequent causes. Its onset may be gradual or sudden involving either a whole or a portion of the nerve, and it is always present in the same side as the ear affected. The facial paresis or paralysis is produced by an inflammation of the nerve in its passage through the middle ear, usually caused by pressure. The severe inflammatory process extends and erodes the tympanic wall of the Fallopian canal either directly involving the nerve or else subjecting it to pressure from the inflammatory exudate within the canal or without. There may of course be only a mild perineuritis or neuritis. Occasionally the seventh nerve is involved through a defect or dehiscence in the tympanic wall of the facial canal.

The prognosis is very favourable under prompt and rational treatment. Operate immediately upon the appearance of the facial paralysis resulting directly from middle ear or mastoid suppuration. Remove all diseased bone and granulation. Establish free drainage by a simple mastoidectomy or radical mastoid according to the nature of the lesion. Even before the mastoid operation is performed, a paracentesis should be done to relieve the tension in the middle ear. The prognosis is naturally influenced by the cause, duration, presence or absence of muscle degeneration. If actual division of the nerve has occurred permanent paralysis will result unless the segments are reunited. If paralysis is due to pressure then the prognosis is good providing the drainage is free and early affected; if due to necrosed bone much will depend on the possibility of removing the existing bone lesion and how much damage has already been done to the nerve. In the early stages of facial paralysis the electrical reactions of the facial muscle are diminished; if there is no response to Faradic stimulation the outlook is grave. To prevent atrophy of the facial muscle daily massage and electricity should be instituted as early as possible.

MEDICAL EDUCATION IN JAPAN

By Frank W. Schofield

Bacteriologist, Union Medical College, Seoul, Korea

THE following brief sketch is not written with the purpose of recording accurate statistics on this subject, but rather to give the reader a general idea of how such work is carried on in this far-off Eastern country.

While en route for Korea I was fortunate enough to meet Dr. Avison (M.B., Toronto) in Tokyo, and to be invited by him to make a tour of inspection of several of the best medical institutions in Japan. Seven of the fourteen medical colleges, as well as the famous Kitasato Institute and Imperial Institute for Infectious Diseases were visited. Thus a good insight into Japanese methods of medical education was obtained.

There are at present between 6,000 and 7,000 medical students enrolled, and hundreds of young men waiting to enter the ranks as soon as accommodation is available. The young men of Japan are determined that lack of education shall not bar their progress in after life; as a result all departments of the universities are likewise full and overflowing. Those who can not secure education during the day, manage to attend one of the many night schools during the evening.

Two standards of medical colleges exist, under the Imperial University. Entrance to the higher grade requires a standard almost equivalent to senior matriculation, while junior matriculation would give a man an excellent pass to the second grade college. The student receives a four year course, and during this period covers the same subjects, and in much the same order as in any American college.

The fee per year varies at different institutions from $25.00 to $50.00. This in most instances covers all official expenses. Even these small fees would be prohibitive to our students in Korea, who pay the small sum of $50.00 for a full four year course. Naturally such small fees do not go far in supporting the institution,

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which derives its funds either from the Imperial Government, Local Government, hospital attached or private subscriptions.

In one instance a splendid medical school and hospital were not only entirely self-supporting, but at the same time paying off an inaugural debt of $400,000.00 at the rate of $40,000.00 per year, and banking $5,000.00 annually. The Dean of this college was kind enough to go into the details of the high finance, which was most interesting, but unfortunately too lengthy to repeat here.

Before leaving the student, it might be interesting to follow his career after graduation. Until recently, unless a graduate of one of the universities, a further Imperial Government examination had to be passed, before a license to practise was granted.

Few men, however, pass directly into active practice. If the graduate possesses unusual talent he will most likely receive an honorary position in one of the medical schools as an assistant. After a few years a small salary of $15.00 to $25.00 per month may be received which is carefully placed away to help defray the expenses of a trip to Germany, which usually follows three or four years later. Post-graduate work in Germany is very essential before an important position can be obtained.

The average graduate is dependent upon his father for support for several years after leaving college, during which time a small practice is being established.

Some remunerative positions can be obtained in the smaller private hospitals. Here from $25.00 to $35.00 is the usual salary. The men are well trained but local conditions make it almost impossible for the physician to obtain a salary sufficient to live on. The majority of the people have not yet been educated sufficiently to appreciate the value of a trained doctor, and also seem to be inately fond of "patent medicines". Moreover, the masses are poor and will not part with their hard-earned money unless they absolutely have to.

Getting back to the subject of medical education, the facilities for teaching are generally excellent. One thing that impressed me more than anything else was the splendid collections of wax-work models. Everything had been made in wax with wonderful dexterity. Even bacterial growths had been so perfectly imitated in wax that one could not distinguish the artificial from the real. These models were of course used largely for demonstration purposes. A unique collection is that of Professor Dohi's at Tokyo. Here, beside many models representing almost every known skin disease, are several series of models depicting in life-like exactness the effect of radium and other similar treatment on malignant growths.

The class-rooms are large and the furnishing satisfactory, but not as elaborate or comfortable as in western institutions. One must, however, remember that many of these buildings are from twenty to thirty years old.

The laboratories are well illuminated usually with continuous glass windows, but the working place per man is often too limited. An excellent idea for obtaining good light for all the class, is the elevated platform. One row of desks follows closely the contour of the room, a second similar row is placed a few feet in the rear, but on a platform raised about eighteen inches above the level of the floor. Thus all students obtain equally good light. This plan seemed to me well worth adopting where space is limited.

The equipment of most laboratories is very good. The apparatus and instruments are, however, almost exclusively of German origin. Japanese material will undoubtedly replace the German as new equipment is required. Excellent native microtomes are on the market, and a good resistant glass ware has recently been produced.

In all the Government medical schools there is evidence of much research work being done. Each department seemed to have plenty of room and equipment and frequently the advantage of an individual library. The latter is, however, very much German. In one instance, out of about twenty journals there were but three in the English language, the others being German. It was interesting to note that two of the three were journals of recent publication.

The professors are men of high standing and like our own frequently appear profound and studious. Practically all are Japanese graduates who have taken post-graduate work for several years in Germany. Germany is the ideal in medical education. This is quite natural as German professors introduced and founded medical science in Japan, many years ago, and since then hundreds of the leading Japanese physicians have taken post-graduate work in that country. Many busts and occasionally a shrine to eminent German professors are to be seen in the university grounds, indicating appreciation of past services.

The students all appear to speak a certain amount of German and many of the text-books are in the same language.

However, there is some consolation in knowing that the Japanese navy is just as English as Japanese medicine is German, and the people generally are markedly pro-British.

Before closing, a few words must be added in praise of the

Kitasato Institute. Dr. Kitasato is so widely known as an eminent scientist that it will be gratifying for many of his friends to know that he is now directing a private institute which is doing for Japan what the Lister Institute is for medicine in England, and the Pasteur Institute for France. A most enjoyable morning was spent with him and his assistants. Working with Dr. Kitasato are Drs. Hata, Shiga, Miyajima, and Kondo, as well as many other younger men of first-rate ability.

Another excellent institution where similar work is being carried on, is the Imperial Institute for Infectious Diseases.

From this brief sketch one can realize how medical education is going ahead in this somewhat isolated country, and need not look with surprise at the fact that the leading bacteriologist in America to-day is a product of its labours.

DR. MASON LITTLE has given up his work with the Grenfell Association at St. Anthony, Newfoundland, and intends to go into practice at Boston, Massachusetts. Dr. Little has laboured along the Labrador Coast for the past ten years and has won the esteem and affection of its people.

DR. WILLIAM FROTHINGHAM ROACH, of Montreal, has been admitted to the freedom and livery of the Feltmakers Company and the City of London in recognition of his work in the field of research at McGill, Oxford, Dublin, and London. Dr. Roach served as medical officer on the West African Medical Staff and has done research work on yellow fever at Para and Manaos, Brazil. He is a member of the British Pensions Medical Board, lecturer on school hygiene at King's College for Women, and surgeon at the London Skin Hospital.

HELPING TO SOLVE A PRAIRIE PROBLEM

How the People of the Western Provinces are endeavouring to Provide Hospital Accommodation for their Rural Sick

By David Grieve Tuckwell

Formerly Mayor of Lloydminster, Saskatchewan, organizer of Municipal Hospitals for the Province of Saskatchewan.

A VERY widespread interest has been aroused throughout the western provinces concerning the question of hospital accommodation and nursing attention for the prairie sick. This matter has been the subject of legislation in the twin provinces of Saskatchewan and Alberta, whilst in Manitoba and British Columbia public interest is crystalizing in favour of similar enactments. Saskatchewan was the pioneer in this movement, and by an Act passed last year made provision whereby groups of rural and urban municipalities may coöperate in the erection and maintenance of hospitals to serve their people. Alberta has followed this good lead, and an Act very similar in character received its final reading and was placed on the statute books of the province during the recent session of the legislature.

The Saskatchewan Municipal Hospital Act provides that two or more rural municipalities may coöperate with one or more urban centres in the establishment of a municipal hospital. Each municipality concerned has the power to levy a rate not exceeding two mills on the dollar, on all assessable property within its borders, for hospital purposes. The managing board is composed of representatives appointed by the councils of the coöperating municipalities, but not necessarily members thereof, and is a body corporate, with powers governing such bodies.

Possibly the feature which has commended itself more especially to the prairie people in connexion with the establishment of these rural hospitals, is the immense benefit which they are calculate to confer in maternity cases and emergency sickness. In the sparsely settled districts of the West, where the local medical men have to travel long distances, and in the almost total absence, over wide areas, of capable nursing assistance, women are enduring very serious hardships. Not only are they called upon to perform their ordinary household duties, but all too frequently the hard laborious work of the farm falls to their lot; this harsh physical striving has a very pernicious influence, especially during the later pre-natal period, immensely increasing the perils of maternity. It will be easily understood, therefore, how anxiously the prairie women are looking to this rural hospital movement for relief.

As an indication of the esteem in which these institutions are held where they have been established, the following quotation from a letter written by the secretary-treasurer of one of the contributing municipalities may be of interest: "Before the inauguration of the present system (that is of free hospital accommodation) only a small percentage of maternity cases passed through the hospital, the women cheerfully taking a chance on their lives for the sake of helping the farm along. During the past five months nineteen women from this municipality have been in the hospital. We are saving the lives of our women at the small cost of three quarters of a cent per acre."

Broadly speaking four rural municipalities require a hospital providing accommodation for twenty-five beds, besides quarters for the working staff. The cost of such an institution for building and equipment is estimated at from $1,200 to $1,500 per bed capacity, or between $35,000 and $40,000. Raised by debentures spread over a term of thirty years, and borne by the municipalities in proportion to their assessable value, this capital expenditure represents a very modest increase to the homesteader's taxes. Regarding maintenance, whilst it might be difficult to determine absolutely the cost to any one municipality, careful investigation suggests that from fifty-five to seventy patients might be expected from each rural municipality, with an average stay in hospital of fourteen days, at an estimated cost of $2 a day per patient. This would mean that for capital cost, on thirty year debentures, bearing interest at 6 per cent., each rural municipality would have to provide less than $1,000 per annum, whilst for maintenance, should the maximum estimate be realized and seventy patients receive treatment for fourteen days per patient, $1,960 would be required, or a total cost to each municipality of something like $2,960. As the Saskatchewan government, however, makes a grant of fifty cents per day for every patient in the hospital receiving treatment, $490 would be received from this source, leaving the rural municipality to provide less than $2,500 to meet its debentures, establish a depreciation fund, and pay the hospital fees of any of its ratepayers or their dependents. When it is remembered that the 297 rural municipalities in the province of Saskatchewan have an average assessable value of $2,750,000 each, it will be seen that a one mill rate will yield at least $2,750, or $250 in excess of the total amount required as the proportion from any one municipality to finance the whole undertaking of building, equipping, and providing free hospital accommodation, and the best of skilled nursing attention for every ratepayer and his dependents who may require it, and that without involving any sense of obligation, as the system is one of coöperative municipal insurance.

A twenty-five bed hospital such as is above referred to, would possibly require a staff of five graduate nurses, including the matron. Express provision is not made for the employment of a medical superintendent, the local doctors throughout the district having free access to the hospital for the treatment of their patients. Should the board, however, favour the employment of a resident medical man, there is nothing in the Act, in either Saskatchewan or Alberta, to prevent this idea being carried out.

Dr. Maurice M. Seymour, commissioner for public health in the province of Saskatchewan, has manifested the very warmest sympathy towards this movement ever since its inception, and owing to his active interest, and that of the Minister of Municipal Affairs, the Honourable George Langley, under whose department the Bureau of Public Health is administered, meetings have been held in many parts of the province where information as to the operation of the system has been afforded. Where such hospitals have been erected, the people are enthusiastic as to the benefit which their operation has conferred. The local medical men are also keenly interested. In one district where such an institution is projected, the local practitioners have agreed amongst themselves to take a post-graduate course in order to brush up their surgery so as to qualify themselves further for their work, the absentee's patients to be attended by his brother physicians, who will in turn take advantage of the like courtesy.

Altogether this movement appears to be one destined to have a far-reaching influence throughout the western provinces, and its operations will be watched with the keenest interest by all who have the well-being of our prairie people at heart. It has received nothing but the warmest sympathy from the medical profession, the pulpit, and the press. Speaking at the convention of rural municipalities of Saskatchewan, held at Saskatoon some weeks ago, the writer predicted, (a sentiment received with a marked demonstration of approval), that the time was not far distant when a municipal hospital, free of access to the people, would be within reachable distance of every homesteader and his family throughout the province.

In connexion with this movement the Commissioner for Public Health proposes to establish a system of district nurses, whose duty it shall be to visit the country schools, give pre-natal instruction to expectant mothers, and act to some extent as a connecting link between the hospital system and the people living in the more out-lying districts. Where the districts are too remote to adopt the hospital scheme rural municipalities are being encouraged to subsidize local medical men as an inducement to their settlement.

A bonus of twenty-five dollars is also made to needy expectant mothers so that it will be seen that the government of Saskatchewan is striving manfully to solve one of the great pressing problems of the West; or is at least guiding the people wisely in their endeavour to arrive at a satisfactory solution of their own.

A CHILD WELFARE EXHIBIT was held at St. John's, Newfoundland, in August, as a means of stimulating public interest in the prevention of infant mortality. The average death rate among infants of less than one year of age is high throughout the Island, but particularly so in St. John's; during the past eight years the average rate throughout Newfoundland was 140·13 per thousand, and in St. John's 197·08 per thousand.

OZENA AMONG THE VARIOUS RACES OF THE EARTH

By J. N. Roy, M.D.

Physician to the Hôtel-Dieu, Montreal; late Special Delegate of the Canadian Government; Laureate of the Academy of Medicine of France

As we have had, through extensive travels during the last ten years, the opportunity of coming into contact with the principal people of the globe, and have thus been in a position to study on the spot anatomical, physiological and pathological conditions, we have considered it proper, at the present time when the rhinologists, who are gathering documentary information in view of next year's International Congress, are particularly interested in the matter, to publish our observations and conclusions in regard to ozena. To escape repetitions, and especially to remain on purely scientific grounds, we shall divide the people of the earth, from an ethnological standpoint, into three large families: the white, the black, and the yellow. Indeed, if we consider carefully the characteristics of the Malays and the Redskins, we find that the representatives of those two races have had the Mongolians for ancestors. The colour of the skin, the shape of their eyelids, the development of their malar bones, the flattening of the base of their nose, the thickness of their hair, and generally speaking their general facial expression, are all arguments in favour of our theory. Moreover, we find in the language of certain Indian tribes of South America a number of expressions very similar to certain Japanese words, and inscriptions and writings, undoubtedly vestiges of those which adorned the shrines of Buddha, are also often found in Mexican ruins.

We shall have little to say about the white race, as such a large number of articles on ozena have already been published; we simply shall draw some conclusions from what we observed in cross breeds of white with either of the other two races.

Read before the "Congrès français d'oto-rhino-laryngologie," Paris, May, 1914. Received for publication August 1st, 1917.

The blacks are particularly interesting, and a careful study of them in Africa, America, and Oceania reveals some very instructive facts. In the course of an extensive voyage around the Dark Continent, we examined the nasal cavities of nearly five thousand negroes, in twenty-two different colonies. On several occasions, we penetrated into the interior of the country a long distance from the coast line, and were in a position to visit about a hundred different tribes. After making a most careful and minute examination of those aborigines of Africa, all over the country, we may state, considering the large number that came under our notice, that they do not suffer from ozena. We made a particular study of those races which are not full blooded or pure, as the Mulattoes, the Moors of Mauretania, of Arab and particularly of Berber descent, the Peuhlx, the Foulahs, whose ancestors were the Egyptian Fellahs, the Hottentots and the Bushmen, in whose veins there is a certain quantity of Mongolian blood, the Danakils, Somalis and Gallas, of mixed Arab breed, and finally the Abyssinians, who at various periods of their history were often in close contact with the Egyptians. Those people also showed no signs of atrophic rhinitis. This disease is also unknown among the negroes we examined in Oceania and in the West Indies, and we had to return to the American continent to find it.

During our stay in Brazil, where three quarters of the population is black, in Central America and in the United States, we were surprised to find a large number of cases. We discovered it in pure breeds as well as among the Mulattoes and the Zambis (the offspring of Negroes and Redskins).

Our excellent confrères, Doctors Chardinal (of Rio de Janeiro) and Jones (of Newport News, Virginia), also found a number of blacks afflicted with ozena. Their findings show that the disease appears less prevalent among the Negroes and Mulattoes than among the white and yellow race, and we are entirely of that opinion. Their mucous membranes in general are very resistant to infection, and it requires a prolonged contact with very virulent microbes to cause a disease.

The yellow race of Asia and its different ramifications which spread practically all over the globe are particularly predisposed to atrophic rhinitis. We found it not only in the Chinese and Japanese, but also in certain Indo-Chinese of Mongol cross breed, in the Esquimos, the Laplanders, the Finlanders, the Malays, the Philippinos, the Hovas, and the Redskins. The frequency of the disease varies according to certain conditions which we shall try to explain now in studying the causes of ozena among the different races.

Contrary to the opinion expressed by F. Fraenkel, Gottstein, Couetoux, Boulay and many other authors, who believe that ozena is preceded by a preatrophic hypertrophic rhinitis, we agree with Bosworth that such is not the case. We examined the Chinese in their own country, in tropical climes and in cold countries such as Canada in winter, and we did not find that climate was a factor in the frequency of the disease.

By studying a large number of cases, we found, generally speaking, that Mongolians have a tendency to atrophy of the anterior third of the inferior turbinal without any pathological symptoms. This is particularly evident if they reside in a hot climate; and in colder countries, we find they suffer from hypertrophic rhinitis, though not as often as whites. The Indians of the American continent are predisposed to that kind of atrophy, which is also found in a lesser degree in the cross breeds. In none of the cases does the enlargement of the inferior turbinal seem to have any influence on ozena, the frequency of which varies according to the more or less contaminated surroundings. Moreover, the African negroes often suffer from hypertrophic rhinitis if they live in a cold damp clime, though they do not show any lesions in their own country. We were astonished at the frequency with which we observed the deviation of the septum in the yellow race and especially in the Indians, among whom we found it in no less than 40 per cent. of all those we examined. This malformation is also more frequently found in the cross breeds than in whites.

We scarcely ever found compensatory hypertophic rhinitis in the largest side of the nasal cavities in the Mongolians; more often we observed the presence of a muco-purulent discharge with a crusty deposit devoid of odour. This corresponds to a state of pseudo-ozena. In cases of true ozena we found the odour weaker and less repulsive than in whites and blacks. We draw particular attention to this fact and believe it to be due to a physiological increase in the quantity of the nasal secretions proper to that race, which prevents the drying of pus and thus shortens the life of bacteria and partly prevents the formation of their toxines.

The deviation of the septum in the Mongolians, combined with the formation of non-ozenous mucosities in much expanded nasal cavities, is an argument against the theory expressed by Zaufal, who pretends that atrophic rhinitis is found in those individuals who possess very large nasal cavities, where the weakness of the air draughts allows stagnation and decomposition of the secretions. On the other hand, the Negroes—who scarcely ever show any deviation or spurs of the septum—have the arch of their palate lower than in the white and yellow race, the nose flat and broad with wide nostrils, and in Africa they do not suffer from ozena.

We shall not bring forward arguments to offset the theories of epithelial metaplasia sustained by Siebenmann or against Zarniko's theory of tropho-neurosis, or that of osteomalacia of Cholewa, of primary infection of the sinus, as advanced by Vieussens-Gründwall; we shall simply repeat that there is no atrophic rhinitis to be found among the natives of the Dark Continent. The same may be said about tuberculosis which also exists in those countries.

The infectious theory of ozena appears to be the only one which will satisfy every demand. We do not intend to discuss again, as it has already been done on several occasions, the value of the capsulated cocco-bacillus of Löwenberg, of the pseudo-diphtheric bacillus of Belfanti and Della Vedova, and of the small bacillus of Pes and Gradenigo. We believe the cocco-bacillus of Perez (of Buenos Ayres) is really the specific vehicle of the infection, since experiments conducted in the laboratories confirm and prove that theory. The cocco-bacillus when injected into the circulation of an animal is the only one which causes atrophic rhinitis with the characteristic odour of ozena. The other microbes found in the nasal cavities only act as secondary agents.

After examing in both Americas a multitude of Indians belonging to twenty-seven different races, and a large number of cross breeds, we observed that local conditions and surroundings cause a more or less frequent appearance of the malady. Rare enough in those parts of the country where the natives live on high ground scattered in the open air, the disease is found much more frequently in the towns and on the plains where they live under more congested conditions and breathe impure and contaminated air. Among the latter we even found the disease in about 6 per cent. of the population, and as the women are more confined to their homes and live in a more secluded manner than the men, they are more often infected. We observed the same conditions in Malasia, China, and Japan.

Redskins and cross breeds are equally infected by ozena; still the yellow race appears to be more susceptible to the disease than the whites. We believe the reason for this condition is to be found not only in the filth some of the Mongolian races are addicted to, but also to the want of symmetry in their nasal cavities.

The deviation of the septum which we observed very often in them. naturally causes respiratory defects and a greater abundance of stagnant secretions than in the whites—with equal lesions—and the bacillus of Perez finds a field quite prepared for its culture and development.

In Madagascar, our excellent confrères, Doctor Fontoynont and his assistant, Doctor Roton, were kind enough to show us some cases of true ozena among the Hovas. It is interesting to note that that race, which is of Malay descent with a slight mixture of Hindu blood, is the only one which shows any susceptibility to the infection, though they come in fairly intimate contact with the Negroes who do not yet suffer from that disease.

That ozena is distinctly of microbic origin is most conclusively proved by observations in Africa. Of all the blacks we examined in that vast continent, not one was infected. Not even among the natives of mixed descent whose ancestors may perhaps have suffered from the disease, which probably disappeared through the purifying agency of the sun's rays in a sand covered tropical region. And yet, when removed from the slave coast to Brazil —to an equatorial clime, similar to that of their own country— these negroes in contact with the infected aborigines, soon become infected themselves. When transplanted to the northern parts of South America into Central America or to the United States, they brought the disease with them or contracted it in these countries. Their Mulatto or Zambi descendants in turn were infected, and according to statistics, these blacks are more often contaminated than those of pure blood. This is probably due to their closer and more intimate connexions with the white and yellow races, and also to the heredity of the diathesis of the latter, which in a general manner reduces to a great extent their power of resistance.

It is thus very evident that the blacks are not immune to ozena, and it will be interesting to know how long Africa and Oceania will remain free from contamination, and particularly the West Indies, which would seem to be more exposed to the infection since they are inhabited to a great extent by Mulattoes who often visit the American coast.

Now, if we are allowed to draw certain conclusions from the observations we collected from all quarters of the globe, we may say that ozena is an infectious disease and is found in all races. Yet, the disease is less frequent among the blacks than among the whites, and is most prevalent among the yellow race. The marked deviation of the septum on these latter, to which we must add their state of habitual uncleanliness and nasal irritation, produce in their mucous membrane a splendid breeding ground for the microbes.

The blacks of Africa, Oceania and the West Indies are not yet infected, although they are susceptible to the disease, and the small number of Europeans who came under our notice—and they were not afflicted with ozena—does not allow us to express an opinion as to the future appearance of the disease in these countries.

The Sixth Annual Congress of the Canadian Public Health Association will be held in Ottawa on September 27th and 28th, 1917. The meeting of the Canadian Association for the Prevention of Tuberculosis will also be held in Ottawa on September 26th, 1917.

BACTERIURIA IN SOME CHRONIC DISEASES WITH SPECIAL REFERENCE TO INTESTINAL STASIS

By

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Brandon, Man.

IN French's "Index of Differential Diagnosis," we find this statement: "Bacteriuria is a rare symptom of general infection, save one of such intensity that an acute nephritis, associated with a definite hæmaturia, has supervened. Usually its appearance indicates a purely local infection." The writers of this paper believe that the above quotation, which was written in 1912, represented then the almost universal opinion among medical men on the subject of bacteriuria. In scanning the recent literature we see little change of attitude on the part of the great majority, and note only isolated efforts, here and there, to investigate the subject. We have been convinced for some time that the condition known as bacteriuria could not be dismissed thus summarily, and that a systematic culture of the urine in chronic diseases would reveal some interesting facts. Consequently during the past three or four years we have cultured the urine in every chronic condition coming under our notice in connexion with our work. This is a preliminary report of some of our findings up to the present time.

At the outset we wish to make a few observations regarding our methods. Each specimen of urine has been collected with great care, either by a trained nurse specially qualified for this work, or by one of us during the course of a cystoscopic examination. The catheters and containers are auto-clave sterilized. The urethral orifice is thoroughly disinfected. Only the last portion of the urine is taken, so that urethral contamination is avoided.

Read at the forty-eighth annual meeting of the Canadian Medical Association, June 15th, 1917.

Every known precaution is taken to keep out any organism outside of that existing in the bladder or kidney urine, as the case might be.

We have carefully eliminated from this report all acute or subacute conditions, such as acute or subacute appendicitis, acute cholecystitis, acute cystitis or pyelitis, acute pelvic inflammations.

All the cases reported have been subjected to a rigorous and thorough examination in accordance with well recognized modern methods. Every effort has been made to discover hidden foci of infection from which the bacteriuria might have originated. Where, for instance, we report the presence of bacteria in the urine in intestinal stasis cases, it is understood that careful examination has failed to discover any other focus of infection which might account for the urine condition.

In this analysis of the urine findings, in three hundred and fifty cases of chronic disease, the conditions naturally group themselves mainly under several headings, and we shall report them accordingly, viz., tuberculous kidney, chronic pyelitis, chronic arthritis, chronic pelvic inflammatory conditions, intestinal stasis.

1. *Tuberculous Kidney,* 16 cases. The diagnosis was made in every case by the cystoscope, and the urine for culture obtained from the affected kidney by ureteral catheterization. In this list is not included non-secreting dead kidneys. Of the sixteen cases eight gave staphylococci, four gave colon bacillus, and four gave no culture—eleven out of the twelve cases which gave cultures showed pyuria. The average leucocyte count was ten thousand. The average time that symptoms had existed was seven years.

2. *Chronic Pyelitis,* 80 cases. In these cases again the diagnosis was made by cystoscope and ureteral catheterization. Of the eighty cases, thirty-three gave staphylococci, thirty-six gave colon bacillus, eleven gave no culture. Sixty-three out of the sixty-nine cases giving cultures showed pyuria. The average leucocyte count of all cases was nine thousand. The average time that symptoms had existed was 3·3 years.

3. *Chronic Arthritis,* 34 cases. In chronic arthritic conditions we began by attempting to get cultures from the infected joints. We never succeeded in obtaining a culture, thus bearing out the contention of the late Dr. John B. Murphy that the infecting organism in arthritic conditions is not often found in the joint secretion. In thirty-four of these cases urine cultures gave staphylococci in ten cases, colon bacillus in ten cases, and fourteen gave

no culture. In only one case of the twenty giving positive cultures was there pyuria present. The average leucocyte count was ten thousand. The average duration of symptoms before examination was four and a half years.

4. *Chronic Inflammatory Conditions in Pelvic Organs,* 70 cases. In chronic pelvic conditions involving uterine adnexa, there are seventy cases to report. Five of these gave staphylococci, nineteen gave colon bacillus, and forty-six gave no culture. The average leucocyte count was seven thousand, five hundred. The average duration of symptoms prior to examination was seven years. The low percentage of cultures from pelvic cases may be explained by their probable Neisserian etiology.

5. *Intestinal Stasis,* 153 cases. We desire to place special emphasis upon the investigation into the relation of bacteriuria to intestinal stasis, since it is here we have obtained the most striking findings. In this series we exclude stasis caused by malignancy, acute and subacute intestinal obstructions, and tuberculous peritonitis.

The cases of intestinal stasis have all been diagnosed fluoroscopically, with minute attention to such details as time, position, fixation, etc. The barium-buttermilk meal is given and observation made of the stomach and duodenum with reference to position, tone, peristalsis, form, tenderness. In five hours, the normal emptying time of the stomach, a second observation determines this, and also the progress in relation to the ileo-cæcal junction. In eight hours, the normal emptying time of the ileum, another observation determines if there is any delay in the ileo-cæcal region. From this point observations are made every twenty-four hours until the large bowel is empty. We refer with some confidence to the results of the fluoroscopic findings in intestinal stasis, because in a large percentage of these cases which were later operated, not one case belied the diagnosis which the x-ray indicated.

In one hundred and fifty-three cases of intestinal stasis twenty-one gave staphylococci, forty-six gave colon bacillus, while eighty-six gave no culture. In only ten of the sixty-seven positive cases was pyuria found. The average leucocyte count was ten thousand. The average duration of symptoms prior to examination was nine years.

Further analysis of this series gives some interesting information. In 60 per cent. of all cases the stasis involved the last twelve inches of the ileum, or the caecum, or ascending colon. In 30 per cent. of all cases it was a general delay in the colons. In 10 per cent. there was definite delay at the hepatic or splenic flexures, or in the sigmoid. In 12 per cent. of all cases there was accompanying stasis of stomach contents. The average emptying time of the ileum was delayed to eighteen hours, that of the large bowel to eighty-five hours. The relation of stasis to ptosis of the stomach and intestines is not so close as one might suppose. In only 25 per cent. was there ptosis of the stomach, and in only 15 per cent. was there ptosis of the intestines. The relation to the secretory activity of the stomach is represented by an increase of free HCl —the average being thirty-four (normal twenty).

The finding of bacteriuria in 44 per cent. of all cases of intestinal stasis (sixty-seven out of one hundred and fifty-three) may seem a relatively large proportion, but we wish to call attention to the fact that this figure represents a minimum percentage. These sixty-seven cases represent the result of but a single urine culture, in each case taken when the patient first presented for examination —the exigencies of private practice do not permit of unlimited investigation. We doubt not, of the remaining eighty-six cases a fair percentage would have given positive cultures if repeated tests had been made, for it is a fact observed repeatedly by us that these stasis cases have periods of bladder irritability, lasting, it may be only a few hours, when it is possible to obtain a positive urine culture, where prior repeated attempts had failed.

We have gleaned valuable information concerning the possible causation of intestinal stasis from our operative work on these cases. In the first place we have repeatedly secured cultures of pure colon bacillus from a smear taken from the bands severed during the course of the operation; this, independent of the location of the band, whether cæcal or ileal, or both. Cultures have been obtained from ileal bands as far as eight inches proximal to cæcum, where no bands existed at cæcum or ascending colon. In the second place, a slight error in technique led to a suggestive discovery. During our early cases an occasional post-operative complication was the occurrence of an abscess in the subcutaneous tissues around the site of incision. The pus from these abscesses gave pure culture of colon bacillus. This complication was later eliminated by an improvement in technique whereby the banded area was not allowed to come in contact with the subcutaneous fat.

Treatment. While treatment of bacteriurial conditions does not come within the scope of this paper, yet the results of treatment have some bearing on the relation between the bacteriuria and the disease condition.

In a large percentage of the cases discussed in this series, operative treatment has been done. In every case in which staphylococci or colon bacilli were found in the urine, autogenous vaccines were prepared in our laboratory and administered. Improvement and progress by the patient has in most cases been accompanied by bacteria-free urine, and relapses have been marked by the ability again to secure cultures from the urine. Complete cessation of symptoms has invariably been accomplished by bacteria-free urine.

Summary. We have submitted in this discussion the statistics of our findings: we do not seek to offer any dogmatic interpretation of the meaning of these facts. We make no claim that the bacteria found in the urine in chronic diseases is the infecting cause of the disease. We are content to have contributed some information gained by a systematic and painstaking investigation of bacteriurial conditions, especially with reference to the subject of intestinal stasis.

In conclusion we would draw attention to the following facts elicited in this series of three hundred and fifty cases:

1. The large percentage of positive urine cultures in this series—over 55 per cent.
2. The ability to obtain positive cultures although pyuria was present in only 17 per cent. of the cases (apart from pyelitis).
3. The almost uniform clinical improvement under vaccine treatment.
4. In intestinal stasis—the predominance of colon bacillus in the urine cultures.
5. In intestinal stasis—the obtaining of colon bacillus cultures from smears taken from under dissevered bands.
6. In intestinal stasis—the repeated negative urine culture coincident with the clearing up of symptoms following operation and vaccine therapy.

These findings suggest to us the strong presumption of an intimate association between the bacteriuria and the chronic disease.

Case Reports

A REPORT ON THE SPRING-BALANCE MUSCLE TESTS AS DEVISED BY LOVETT

By Lionel M. Lindsay, M.D.

Children's Memorial Hospital, Montreal

THE subject of the after-treatment of poliomyelitis is particularly interesting at the present time on account of the vast amount of material resulting from the recent epidemic and the opportunity this has given for further investigation and advancement in treatment.

If we divide poliomyelitis into the usual three stages we have: (1) The acute stage, from the onset of the disease to the disappearance of all tenderness; (2) The stage of convalescence, beginning with the cessation of all tenderness and lasting two or more years, during which time there is a natural tendency to improvement of the affected muscles; (3) The stage when all natural improvement has ceased.

After-treatment, then, begins with the stage of convalescence and by judicious treatment the natural tendency to improvement may be aided, while deformity and atrophy are prevented or minimized. Many of the orthopædic operations undertaken in the third stage of the disease are necessitated by the deformity, atrophy or stretching of muscles resulting from improper or neglected treatment during convalescence.

Before beginning treatment it is necessary to make a thorough examination of all the muscles of the body to ascertain which have been affected. Certain groups of muscles which are not uncommonly involved are apt to be overlooked, especially those of the back, the abdomen, and the thumb, unless a systematic inventory is taken.

By the usual *manual* examination it is only possible to say that a muscle is apparently normal in power; partly paralyzed (i.e. weak, or paretic); or totally paralyzed.

About 90 per cent. of all muscles affected by poliomyelitis are only partly paralyzed and are capable of great improvement if not complete recovery, especially if aided by proper methods of massage, muscle-training, etc. In this large group of paretic muscles there are all degrees of weakness, from those showing but a flicker of contraction to those just short of the normal.

Now Lovett and his co-workers in Boston felt the need of a more precise method than that afforded by mere manual impressions in order to determine the power still present in these muscles. In other words: instead of saying the power in a group of muscles was "poor" or "fair", they wanted to be able to state just what power was present and to record the fact in figures. By this means one obtains a precise record of the initial weakness of the muscles, which not only serves as a guide in commencing treatment but also as a criterion in estimating the improvement found at subsequent examinations.

Theoretically the principle is simple; practically there are many difficulties and pit-falls which greatly alter the readings. The test is based on the patient's power to hold a position against the pull of a spring balance. When the pull becomes too strong the muscles give with a sudden "break" and at this instant the scale is read and the number of pounds or ounces are recorded on a card.

The accuracy of the test depends upon a well-trained team of workers, consisting of an operator and an assistant, who are usually women. The operator is responsible for the correct position of the patient. She steadies the part to be tested and gives the word when the assistant is to pull and the patient is to hold. The pull of the assistant is through a spring balance which is attached to the patient by means of a cuff.

In this way twenty-two different muscle groups are tested on each side of the body: ten in the lower extremity, twelve in the upper. It is to be noted that the method only indicates the power of *groups* of muscles and not of individual muscles. It is really a record of the power of abduction, adduction, flexion, and extension, etc.

Standard positions are assumed for each muscle group, and the value of the test consists in the possibility of duplicating exactly the conditions of the first test at succeeding ones, so that a definite idea of gain or loss in muscle strength can be registered.

In order that one may know whether the power found in a given muscle group is normal or not, it is necessary to know the average normal strength of that group and the variations according to age, and so a table of standards has been worked out on normal, healthy children of every age for each of the twenty-two muscle groups to be tested.

Children under the age of four or five cannot be tested as a rule, and there is no satisfactory method of testing the muscles of the abdomen, back, and neck, or those of rotation. Thus there are limitations to the method, especially when one adds that very weak muscles do not give a reading.

The time required for a complete examination is about one hour and depends largely upon the skill of the operators and the docility of the patient. The accuracy of the tests depends entirely upon the skill of the operators, but so great is the personal equation that two well-trained teams examining the same patient would be liable to give results showing considerable variations. Consequently it is necessary whenever possible to have the same team examine the same patient on every occasion. It takes at least a month of steady work to train a team of workers to any degree of proficiency.

The apparatus is simple and inexpensive and consists chiefly of three sizes of accurate spring-balance scales, and a few clamps, etc., for steadying the patient. A solid table is also a requisite.

CASE OF VAQUEZ'S DISEASE

By Dr. R. J. Erickson

Royal Victoria Hospital, Montreal

THE patient came to the Royal Victoria Hospital under Dr. C. F. Martin's service on August 9th, 1916, complaining of pain in left side under rib margin, constipation, and gastric pain after eating. There was an increasing weakness and an extreme degree of drowsiness, the patient sleeping most of the time. There was an extremely flushed condition of skin which patient says has lasted over thirty years, and a spleen which has been enlarged for at least ten years. His attention was first called to his spleen by his physician and since that time he has noticed that it has slowly increased in size. He gave a history of gastric hæmorrhage

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Read before the Montreal Medico-Chirurgical Society, November 3rd, 1916.

once, a small one, and some bleeding from the lower bowel once. Has a history of marked alcoholism for at least ten years and repeated Neisser infection but no luetic infection. An interesting point in the family history is that this appears to be a family condition, the father had a high colour and the patient has four brothers all of whom are very red and flushed, one as dark, if not darker than the patient. This high colour could be seen all over the face, the scalp, the mucous membranes, the retina of the eye, the hands and feet; the hands when hanging down showed marked cyanosis. The spleen was extremely large and came down 15 cm. below the rib margins in the mammary line, extending to the left of the umbilicus. System otherwise negative; heart and lungs normal, blood pressure normal, 120–70, which differentiates this case from one of Geisbock's disease, polycythæmia with splenomegaly and hypertension. The temperature has been somewhat elevated throughout his stay in the hospital, intermittently sometimes as high as 101°. The urine shows a slight trace of albumin and a few casts. Tuberculin test negative, Wassermann negative. Blood picture:

	Aug. 12	Sept. 19	Oct. 31
Polymorph-neutrophiles,.........	76%	90%	78%
Polymorph Basophiles...........	0.	4.	9.
Polymorph Eosinophiles.........	1.	3.	1.
Small Mononuclear Lymphocytes.	4.	2.	3.
Large Mononuclear Lymphocytes.	6.	1.	6.
Transitional....................	10.	0.	3.
Unclassified....................	3.		

The course of the disease in the hospital showed a definite improvement, which is rather an unusual thing as these cases do not generally improve, it being a very slow progressive disease and lasting a life time, the patient dying of some intercurrent affection. The patient has been given *x*-ray treatment on a purely empirical basis and the pain has entirely left him, the spleen is markedly smaller, has decreased at least 3½ cm. in vertical measurement, and moved from the right side of mid line definitely to the left. The cyanosis has become much less, the drowsiness has left him, he is brighter and takes an interest in what is going on.

A study of this case was made in regard to metabolism by Dr. Maude E. Abbott, showing that the basal metabolism was raised 16 per cent. The blood showed as a most distinctive feature a high cholestereal content with increased urea and uric acid content. The nephritic test meal showed a low grade of nephritis with fixation of specific gravity at a high level. Ten days ago there was a slight exacerbation of pain but that decreased rapidly although there is still some tenderness. The liver occupies apparently its normal limit.

This disease was first formulated as a clinical entity by Vaquez in 1892. Later Osler put it on a firm clinical footing by describing a number of cases in which the most common feature and the diagnostic points of importance were the increased red cell count, the large spleen, and the cyanosis. In making such a diagnosis you have to rule out other types in which the red cell count is increased:

Primary: Erythæmia (polycythæmia vera).

Secondary: Emphysema, cardiac decompensation, congenital pulmonary stenosis, in high altitudes, in chronic poisonings (acetanilid, etc.).

After ruling out all these secondary types and showing that the outstanding points are persistent we are justified in calling this a primary polycythæmia. The etiology is unknown. The suggestion has been made that the red cells in some way have lost their power in carrying oxygen satisfactorily, and consequently the bone marrow is stimulated to increased activity. But it has been proved that there is no increased using up of oxygen in the tissues nor are the oxygen carrying powers of the hæmoglobin diminished. So that as far as we know it is something in which the myelogenous elements of the blood are markedly increased, the cause of which is entirely unexplained. Both white and red cells are increased. The pathological findings have been quite negative as far as an etiological explanation is concerned. Tuberculosis has been found in one or two cases; in one case it was proved that the spleen had taken on the embryonic condition of producing red cells. The bone marrow in all cases shows marked hyperplasia, so markedly in some cases that the bones have been thinned from the increase of marrow.

The distinctive features of diagnosis are: the cyanosis, the persistent high unexplainable red cell count, and the enlarged spleen.

FRACTURE IN UTERO; PREGNANCY IN BICORNUATE UTERUS; TYPHOID FEVER

By Harry H. McNally, M.D.

Fredericton, N.B.

A SATISFACTORY reward of the general practitioner is finding a rare case of a given type. The average busy practitioner, feeling that case reporting is the monopoly of the specialist and the hospital man, lets many an interesting case pass without record.

The three following cases justify the request for space for publication.

Case 1. *Suspected Fracture in Utero.* Mrs. W—— gave birth in 1916 to a female child. Dr. Wainwright of Fredericton, who attended the case, tells me although a primipara it was a normal head presentation terminating in a normal manner, without manipulation or instrumental assistance. Three months after delivery, I, for the first time, examined the child at my office and noted the following: A perfect female child down to the knees. Right leg bent at an angle of about 159° at the junction of the lower third of the tibia with the central portion, and appears as a badly treated fractured adult tibia does. The foot on this side was in quite extreme talipes equino-varus and a hasty examination would cause one to think the os calcis wanting, apart from this both feet are of perfect shape, but minus the two outer toes on each foot.

The mother and father of the child are mentally and physically normal; the mother tells me her labour was easy. Both parents tell me that when pregnant about six months the mother fell over the doorstep, striking her abdomen.

At Victoria Hospital on December 6th, 1916, while Dr. S. F. A. Wainwright gave the anæsthetic, I cut down on the right tibia at the deformed point, divided the bone with a chain saw, and placed it in a straight position, holding it in the normal shape with a small Lane plate, then I cut the tendo achilles and placed the leg in antiseptic dressings, holding everything in place with plaster of paris dressings, after stitching the wound with iodized catgut.

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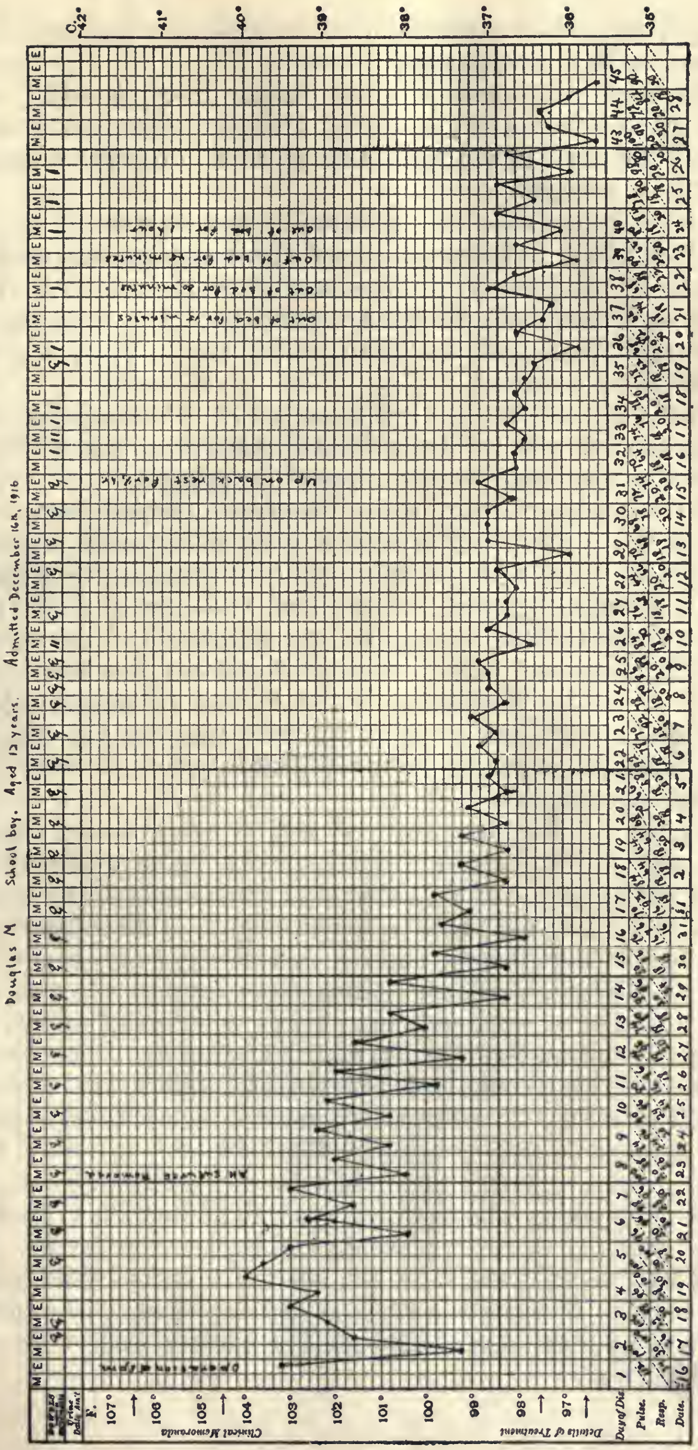
Douglas M School boy. Aged 12 years. Admitted December 16th, 1916
Operation 1:30 pm
All sutures removed
Up on back rest for ½ hr
Out of bed for 15 minutes
Out of bed for 30 minutes
Out of bed for 45 minutes
Out of bed for 1 hour
Clinical Memoranda
Details of Treatment
Day of Dis.
Pulse.
Resp.
Date.
F.
107°
106°
105°
104°
103°
102°
101°
100°
99°
98°
97°
C.
42°
41°
40°
39°
38°
37°
36°
35°

The leg shrunk away from the dressings in about ten days time so I replaced with a new plaster.

The case progressed in a satisfactory way, surgical wound healed by first intention, no stitch abscess, bone united in good position; the foot now, when child is held in upright position, is flat on level surface.

The evidence looks like fracture in utero, in spite of the shortage of toes which furnishes an excuse for non-development theory.

Case 2. *Pregnancy in Bicornuate Uterus.* Mrs. W. T——, a woman of firm build, thirty-seven years of age, who has been married and living with her husband for eleven years and never pregnant till this time.

From the time she first menstruated at thirteen years of age, she had extreme pain at her periods, which were always regular. The most painful time was before the flow appeared.

About two years before the confinement of which I am writing, I was called, and found her in extreme pain in the pelvic region with a small rapid pulse and the appearance of collapse. She had not missed a menstrual period, but the flow was now so slight that I thought, when finding a lump on the right side of the pelvis, of tubal pregnancy and closely watched her for a few hours, to be surprised at finding it clearing up. A further examination led me to diagnose an ovarian cyst. From this time on her menstrual periods were not so painful at every period, although there was an occasional severe one.

Mrs. T—— became pregnant and at what would seem the seventh month, I found her in labour-like pains which quieted. She had not up to this time felt what she was sure were movements of the child. The next month she was again in labour-like pains, which continued to worry her for several days and nights. On the day of delivery, which took place about six p.m. the pains were regular and strong, with each pain firmly contracting uterus could be distinctly felt on the left side of the median line. Per vaginam the presenting head could be felt through the external os, which was now well dilated. I ventured to give 1 c.c. pituitary extract, but as in cases of twin pregnancy the drive did not seem direct, and I delivered a perfect male child by forceps through the brim and into the world. The os which was well dilated allowed me easy access to reach at once the placenta and explore the cavity. That which I had thought might be the head of a second child was the double horn of the uterus with a cavity big enough to admit my hand—a good sized one. The mother made a perfect recovery; the child is well.

This history enables us easily to solve my doubts of the past. The painful menstruation was due to retention within the smaller horn. The supposed ovarian cyst was the main body of the uterus lying to the right side of the median line, while the double horn was nearer the correct position of the normal uterus. This is the first double horned uterus which I have recognized in twenty-five years of obstetrical work combined with much abdominal surgery.

Case 3. *Typhoid Fever.* Douglas M——, a fine specimen of a boy, in a big family, came home from school on Tuesday, ill of headache and vomiting. His mother treated him for everything or anything till Saturday morning, when I first saw him at 10 a.m. with a temperature of 102°, with a furred tongue and complaining of pain in right iliac region. There was a certain amount of rigidity in the appendicial region; the case looked typhoidal. He was very ill and his complaint was of distress in his abdomen. The urine at noon showed an indistinct Diazo reaction. At six p.m. his temperature was 103° and pulse 112. At eight p.m. I opened the abdomen while Dr. Wainwright gave the anæsthetic at Victoria Hospital. The bunch of ileo cæcal glands were enlarged; one as big as a walnut I removed after taking out the appendix. The appendix had within it two small enteroliths and a distinct ulcer.

The following morning his temperature had dropped to 99·1° and he was so comfortable that I felt obliged to retract my diagnosis of typhoid; however the enclosed chart will show the distinct typhoidal course which resulted in perfect recovery.

The abdominal wound healed without the slightest redness about the stitches, which were removed on the eighth day.

I regret that I did not take a blood culture or do a Widal at time of operation, after that it was easily neglected and soon unnecessary, for typhoid spots appeared and the diagnosis of typhoid was assured.

Literature has taught me to watch the appendix, and frequently I have a case which plainly shows appendicial symptoms which pass without surgical interference.

Editorial

THE ORGANIZATION OF PROVINCIAL ASSOCIATIONS

ATTENTION has already been directed in the June number of our JOURNAL to the strong plea put forward by our President Elect in his address before the Manitoba Medical Association for a more perfect organization of their Provincial Association to enable the province to give more effectual support to the Dominion Association. In our present issue appears a letter from Dr. Wishart, Chairman of the Committee of Revision of the By-laws of the Ontario Medical Association, in which he emphasizes the importance of arousing the profession to take greater interest in matters which deeply concern not only the public but also themselves as individual practioners. Changes are taking place in the profession itself, and in its relations to the public, which not only demand from every individual practitioner careful thought, but also demand full discussion by the profession as a body. Important public measures affecting the profession are now being enacted in which the profession should have much to say. To have its due influence the profession must speak as a body, and this can only be done after the details of each enactment have been carefully considered and discussed in a general meeting. In Canada we can with much advantage follow the scheme of organization of the American Medical Association; and this the profession in Ontario are proposing to do. We have similar objects in view to those of our American confrères which are stated as follows: "The Association shall endeavour to unite in one compact organization the medical profession for the purpose of fostering the growth and the diffusion of medical knowledge, of promoting friendly intercourse among physicians themselves, of safeguarding the material interests of the medical profession, of elevating the standard of medical education, of securing the enactment and the enforcement of just medical laws, of enlightening and directing public opinion in regard to the broad problems of hygiene, and of representing to the world the practical accomplishments of scientific medicine." To attain similar objects the profession in Ontario are proposing to form local societies throughout the province, only members of which societies shall be eligible for membership in the Provincial and also in the Dominion Associations. We cordially commend the scheme to all members of the profession in every province, and regard the carrying out of such a scheme as of the greatest importance to the profession in Canada.

DOCTOR COTTON'S PAPER ON THE CAUSATION OF ETHER ANÆATHESIA

IT has been a matter of common acceptance among anæsthetists that the various brands of anæsthetic ethers on the market produce different clinical effects. The same brand of ether varies in its action from time to time according to samples. Nevertheless, we have always looked upon ether as a definite entity, and have considered clinical differences in action due to impurities, such as alcohol and water, left in during manufacture, or to oxidation products due to deterioration. That is to say, we have always thought that the ideal ether for anæsthesia should be chemically pure, and all the efforts of the manufacturers have been extended toward the production of a pure chemical in a container which prevents any oxidation.

Doctor Cotton's work in separating commercial anæsthetic ethers into a purely analgesic and a purely narcotic part changes the point of view entirely. While he states, with commendable modesty, that he has done only some preliminary work on the subject, the clinical results which he produces are a remarkable improvement over those of ether anæsthesia. His work has created the most widespread interest, and surgeons and anæsthetists everywhere are eagerly awaiting the production on the market of an anæsthetic agent such as he recommends.

A voluminous report was presented to Parliament on July 17th by the Special Committee on Returned Soldiers. It contained the following recommendations concerning the care and treatment of returned soldiers:

That both Federal and Provincial authorities take up without delay effective measures to prevent the spread of tuberculosis.

That those soldiers who are hopelessly insane should be cared for at the expense of the Federal Government in provincial institutions under the same conditions as fellow-citizens similarly afflicted;

That returned soldiers who are suffering from venereal diseases should be quarantined at the port of arrival in Canada until cured;

That orthopædic institutions be provided at centres throughout Canada in addition to the one located in Toronto;

That sufficient number of returned men be induced to learn and follow the occupation of manufacturers of artificial limbs and that their services be utilized to supply limbs to soldiers free of cost and renewals and repairs at the cost of the State during the life-time of the soldiers;

That returned men who have been undergoing convalescent treatment and have partially completed courses of vocational training be allowed to continue such courses for a period of two months after their discharge as medically fit if, in the opinion of the vocational training officer of the district, it is in the interest of the State and of themselves that they should do so.

The majority of the committee, including the chairman, Sir Herbert Ames, were of opinion that a special department of the government should be created to direct matters connected with returned members of the Expeditionary Force; other members, however, thought that such questions should be under the control of the Militia Department.

It is suggested in the report that the Dominion and Provincial authorities should coöperate to secure employment for returned soldiers, and that time spent on active service in the case of a civil servant should be accounted absence with leave, his grade and standing in the public service to be determined accordingly.

A conference of medical officers in charge of sanitaria in which returned soldiers are undergoing treatment took place at Ottawa in June. The meeting was presided over by Dr. F. J. Shepherd, of Montreal, and among those present were Sir James Lougheed, president of the Military Hospitals Commission, and Lieutenant-Colonel Thompson, M.P., chief medical officer of the Commission.

The conference was of particular interest in that a number of points came up for consideration concerning the methods of administration and treatment in vogue in the different institutions. A series of questions upon these subjects had previously been submitted to the officers in charge of the various sanitaria by Lieutenant-Colonel Thompson and these, with the replies, formed the basis of discussion. It was adopted some time ago as the policy of the Hospitals Commission that treatment should be given in the sanitaria under its direction to all tuberculous soldiers, whether they had been overseas or not and a large percentage of the cases treated have not been across the water. It was stated that about 1,200 patients had already passed through the institutions and that about 800 were at the time undergoing treatment.

An advisory committee was appointed to assist the Military Hospitals Commission in its work in connexion with tuberculous soldiers. The members of this committee are Captain J. D. Byers, of Ste. Agathe, Dr. C. D. Parfitt, of Calydon Sanitarium, Gravenhurst, and Dr. J. H. Elliott, of Toronto.

A good deal of attention was given to a discussion of some of the difficulties encountered in enforcing discipline. It was decided that in cases where a soldier had refused treatment and had signed a form releasing the Government of responsibility towards him but later had returned and requested treatment, he should be allowed to reattest and should receive the usual pay and allowances. It was considered inadvisable to send men who had refused treatment and been granted total disability pensions to civilian sanitaria at the expense of the Commission—a practise that had been followed in one or two cases—since the total disability pension amounted to more than the pay, and were this known to the men many of them would probably take advantage of it. It has been found that, as a rule, difficulties arise when officers and men are treated together and it was recommended, therefore, that a special sanitarium for officers should be provided. It was also recommended that a central institution should be established for chronic cases of tuberculosis, as they filled up the sanitaria and occupied space that should be available for curable patients. In the case of incorrigibles, it was thought that the best way to deal with them was to send them to a detention sanitarium where discipline could be enforced more strictly.

Some discussion arose as to the number of patients that could be treated by one medical officer. It was agreed that no doctor should be expected to attend to more than fifty patients, and that every additional forty patients, or less, necessitated the services of another medical officer.

This suggestion was made, however, on the assumption that the physician would be responsible for the medical treatment only and that efficient persons would be appointed to look after other departments.

It has been customary for the medical boards at Quebec to recommend tuberculous soldiers for six months' sanitarium treatment. This has led the men to expect to be cured at the end of the time stated and in many cases it has been difficult to control them and to make them understand that they are not sufficiently cured to return to their homes. It would be better, therefore, if no definite time were mentioned. Another point which led to discussion was whether or not a tuberculous soldier should be permitted to go home for a short furlough before entering a sanitarium. The general opinion was that he should be allowed to visit his people as, in the majority of cases, treatment had already been given in England and the disease was probably quiescent and the danger of spreading infection not great. Moreover, if the permission was not given, the man became restive and discontented and would probably refuse to go to the sanitarium at all. As to the question of holiday leave, it was deemed advisable to grant leave, but not at festive seasons. At such times the patients were tempted to eat and drink too much, and at one institution where leave had been granted at Christmas time every one of the patients suffered a relapse. If the reasons for not granting leave at holiday time were carefully explained to the men, Captain Byers thought there would be no difficulty. Last year he allowed his patients to go home between December 5th and 20th instead of at Christmas. A resolution was moved by Captain Byers and adopted unanimously by the conference that it be made a penal offence for any one to supply a tuberculous soldier with intoxicating drink.

The value of occupation was emphasized particularly. Captain Byers said that since vocational training had been instituted at Ste. Agathe, the men had been happier and more amenable to discipline and had made more rapid improvement. They ceased to brood over their troubles when they had something to do, and even those who could not sit up were able to do fancy work. They got up little exhibitions of their work when friends came to see them and became so interested that they forgot everything else.

Other recommendations made at the Conference were, that *x*-ray equipment be installed in sanitaria whenever possible, that the number of beds in one institution be limited to 150 or 200, and that a specialist in diseases of the lungs be appointed to all medical boards.

In an address at the annual convention of Superintendents of the Poor of the State of New York, Mr. George A. Hastings, the executive secretary of the Committee on Mental Hygiene of the State Charities Aid Association, referred to the importance of providing in every community suitable accommodation for the care of the insane while under observation and until they can be taken to hospital. On more than one occasion attention has been called in this Journal to the need for such accommodation in the cities of Canada, but such cases are still sent to the jails because, with one or two exceptions, there is nowhere else to send them. The subject was discussed at the annual meeting of the Saskatchewan Medical Association in July, when a sub-committee was appointed to take up the matter with the Attorney General and to ascertain whether steps could not be taken to provide proper accommodation for the insane for a few days before they were sent to an asylum.

A conference of representatives of a number of provincial organizations was called at Toronto on August 7th, for the purpose of discussing means of checking the spread of venereal disease and a committee was appointed to consider the problem. Among the organizations represented were the National Council of the Young Men's Christian Association, the National Council of Women, the Local Council of Women, the Women's Liberal and Conservative Associations, the Daughters of the Empire, and the Toronto Board of Trade. It was stated by Captain Gordon Bates, C.A.M.C., of the Base Hospital, that approximately 1,500 patients suffering from venereal disease were admitted to that hospital every year, and that during the first three months of 1917 12 per cent. of all the patients in the public wards of the Toronto General Hospital, upon examination, gave a positive Wassermann reaction. Moreover, 25 per cent. of the male admissions to the Toronto Hospital for the Insane were cases of general paresis. It was agreed that the time had come when steps should be taken to inform the public of the danger of infection, and as a restrictive measure it was suggested that women patrols should be formed. It was announced at the meeting that the services of lecturers upon matters connected with the subject under discussion would be available upon demand by any organization that wished to take part in the campaign of education.

ADDRESSING a number of physicians at Hamilton, on July 27th last, Colonel Ryerson, A.D.M.S., Toronto, explained that, under the selective draft scheme, doctors of military age would be divided into three classes according to their physical fitness—Class A, who would go overseas; Class B, who would be posted for duty probably in England or at one of the Canadian camps; and Class C, who would serve on the staffs of hospitals in this country. Forty-eight years was the extreme age limit for home service, and forty-five years for service overseas. Physicians over age might be attached to Canadian military hospitals as consultants. Dr. Wickens, a member of the Ontario College of Physicians and Surgeons, said that the committee appointed to make a census of the medical men in the province, required the names of all medical men whether of military age or not.

It is the intention to establish at Halifax an institution for the education and training of blind soldiers. The work will be organized, on the lines of that done at the St. Dunstan's Home in London, by Sir Frederick Fraser who has been so successful in building up the Halifax School for the Blind.

The summer hotel at Qualicum, the popular resort on Vancouver Island, has been converted into a convalescent home for returned soldiers. The patients—over a hundred in number—are encouraged to go in for all kinds of sport, including boating, tennis, cricket, bowling, and golf, and are given vocational training of every description. A machine shop, garage, and carpenter's shop have been supplied for the training of those who wish to go in for industrial work, and a recreation building is to be established where a motion picture machine will be installed.

As a means of preventing the spread of tuberculosis in cattle, and its consequent distribution through the milk supply, an order-in-council has been passed by the Government, which requires that all dairies in which milk or cream are produced for sale shall be licensed and that no license shall be issued unless the dairy conform to a required standard; that is, unless the stable shall have an ample amount of air space, and at least two square feet of glass for each cow, and shall be well ventilated, drained, and kept clean and sanitary. Two years from the date of the first test of the cattle of a dairy, the sale within the city or town of unpasteurized milk or cream from that dairy shall be prohibited, unless the veterinary inspector can certify that the herd contains no reactor, and in his opinion is free of tuberculosis. The inspectors are to use the tuberculin test and examine the cows.

Compensation will be made to owners of cows slaughtered, at the rate of one-half of the appraised value of those destroyed for open tuberculosis, and two-thirds if destroyed as a reactor at the request of the owner, and valuation is to be made by the veterinary inspector. Milk or cream from a herd containing reactors shall not be sold unless it has been pasteurized.

Whenever in the opinion of the veterinary director-general the work of eliminating tuberculosis from the herd supplying a municipality has reached a satisfactory point, the municipality will be expected to maintain the standard reached.

AN interesting account of the evolution of the municipal hospital in the province of Saskatchewan is published on another page of this issue. The writer, Mr. D. G. Tuckwell, has contributed largely to the success of the movement by his own unfailing interest and his efforts to arouse public enthusiasm in a matter which is of the greatest importance to the public generally. A few months ago a Municipal Hospital Act was also passed in the province of Alberta. It provides that the province shall be divided into hospital districts and that hospital boards shall be appointed which, under the direction of the Minister of Municipalities, shall provide for the location and purchase of a suitable hospital site; the purchase, acquisition, or erection of buildings, furnishings and equipment; and the engagement of duly qualified medical practitioners and registered nurses. It is the duty of these boards also to arrange a schedule of fees proposed to be charged and to decide upon the method of their collection. The Act does not compel a municipality to provide free hospital accommodation but every facility and inducement is offered for the establishment of such hospitals and at the same time the responsibility is placed upon the provincial government of seeing that money collected for this purpose is expended to the best advantage. The taxation is not to exceed two mills in the dollar or two cents an acre, but no tax is to be less than ten cents.

Canadian Medical Association

THE MONTREAL MEETING OF THE ASSOCIATION

The following resolutions which were passed at the last meeting of the Association will no doubt be of interest to the members, particularly those who did not attend the meeting.

It would be difficult to single out any one of these as having greater importance than the others, but undoubtedly, the resolution dealing with the Amalgamation of the Canadian Public Health Association with the Section of Public Health of our Association is of far reaching importance.

Perhaps never in the history of the country has there been greater need for coöperation and collaboration by the various public health organizations.

Another resolution which appears to deserve more than passing notice is the one which refers to the Teaching of Hygiene in all Universities, not only in the Medical Faculty, but in other Faculties as well.

1. Moved by Dr. P. H. Bryce, seconded by Dr. F. Montizambert, that,

In view of the increasing health problems incident to ever growing complexities resulting from the numbers, distribution, and occupations of mankind:

In view of the demands made for the intimate oversight of the life of the individual, the community and the nation, in the interests of health, happiness and efficiency:

And in view of the daily increasing utilization of the discoveries in the exact sciences by medicine, not only for the cure of human ills, but also for the prevention of evils due to heredity and to environment as in the control of foods, housing, hours of labour and industrial conditions,

Be it therefore resolved,

That the Canadian Medical Association recognizing these facts and constantly changing influences which are affecting both the science and art of medicine, as illustrated in the address of the acting President of the Association, should seek to draw closer to it for the promotion of the highest interests of both the public and the profession, other organizations occupying themselves with similar problems, and to this end it is urged by the Public Health Section that the Canadian Public Health Association be invited to consider the propriety of uniting its efforts to those of the aforesaid Section, since

(a) This Section deals with matters of the same character as those brought before the Canadian Public Health Association,

(b) The provinces have their own public health associations,

(c) It is in the interest of public health to unite all scientific workers in matters of public health; and that the Canadian Medical Association as representing seven thousand members of the profession in Canada, is the potent influence in assisting to obtain through legislation reforms through the several legislatures of Canada relating to public health, and to the highest interests of the people of Canada.

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2. Moved by Dr. P. H. Bryce, seconded by Dr. Charles J. Hastings,

That this meeting of the Public Health Section of the Canadian Medical Association strongly recommends the passing of Planning and Developing Acts in all the provinces which have not Acts in force, and the better administration of existing Acts, in view of the needs of proper development schemes being prepared to secure proper sanitary conditions, amenities and conveniences in connexion with the development of rural and urban land, and

That such legislation and the administrative machinery necessary to put it into effect, is especially needed to deal with the successful settlement of returned soldiers on the land, or in properly planned industrial towns, a matter which we regard as one of national urgency and importance,

That the Executive be requested to forward this resolution to the Premiers and Provincial Secretaries of the Provinces of Canada.

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3. Moved by Dr. Hastings, seconded by Dr. Boucher,

Whereas the question of the Teaching of Hygiene has been considered of so much importance that the Canadian Medical Association has put aside a whole session of its Section of Hygiene for its study, Whereas it is proved that such teaching is absolutely necessary to ensure the observation of health laws and by-laws, which are framed for the protection of the health and the life of the citizen,

Whereas to obtain such a desirable result an important place should be given to such teaching,

It is resolved that the Canadian Medical Association strongly recommends:

1st. The organization of a course in Hygiene in all universities, not only in the Medical Faculty, but also for the students of all the other faculties, theology, law, science, etc.

2nd. The organization of a practical course of Hygiene, given by specialists in all the normal schools,

3rd. The adoption of a text-book on Hygiene, to be used throughout the schools,

4th. That the present resolution be addressed to the deans of the different Faculties of all Universities throughout Canada, as well as to the School authorities of all the Provinces of Canada.

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4. Moved by Dr. J. W. McIntosh, Vancouver, seconded by Dr. Stewart, Montreal,

That in view of the public interest involved, and the dangers to members of the community from the prevalence of venereal diseases, and the need for the broadest methods being adopted in Canada for dealing efficiently with such diseases, resolved,

That the Public Health Section of the Canadian Medical Association urges that the Federal Government pass such legislation for the establishment of a Central Bureau with powers to make regulations, and provide such medical facilities for insuring the best results, and that such Bureau be supplied with such a grant as will meet the carrying out of their regulations.

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5. Moved by Dr. Black, of Windsor, N.S., seconded by Dr. Pagé, of Quebec,

Believing that sickness, suffering and premature death may be largely prevented by the properly organized application of modern science and present day knowledge, Therefore be it resolved that the Canadian Medical Association here in Convention assembled, fully apprehending the pressing necessity of a Federal Bureau of Health and Physical Education, respectfully urge upon the Federal Government the formation of such a bureau at the earliest possible date.

At the request of the Montreal Society of Physical Education, the following was incorporated in the foregoing resolution: Resolved that in the opinion of this Society the time has now come for the establishment of a Department of Hygiene and Physical Education under the Federal Government and that the efforts of Dr. Michael Steele, M.P. for Perth, South Riding, and Dr. Eugene Paguet, M.P. for L'Islet, deserve the fullest consideration and attention.

Correspondence

To the Editor,

THE CANADIAN MEDICAL ASSOCIATION JOURNAL.

Sir,—

IN the June number of the JOURNAL I perused with interest your editorial upon the activities of a Provincial Association, founded upon the Presidential Address of the Manitoba Medical Association, and with the ideas therein expressed I readily agree.

It might be interesting to your readers if a further article were published outlining what is being done in the province of Ontario, and I propose to try, as briefly as possible, to outline the changes that are taking place in the organization of the Ontario Medical Association, the reasons that have led up to these and the aims that are sought for.

For a number of years those most interested in this Provincial Association have recognized that the Association was failing to occupy its proper place with regard to the general interests of the profession throughout the province. This was evidenced by the irregular attendance at the meetings and the fact that not more than a fourth of the members of the profession, within the bounds of the province of Ontario, were enrolled as members of the Provincial Association, even when, as was the case, attendance at one meeting and the payment of the fee of $2.00 for that meeting only, entitled the member to permanent enrolment. A committee, therefore, worked at intervals upon the problem and endeavoured to get in touch with the local city committees and territorial associations wherever such existed, and where the members of the profession were not banded together in local societies, the members of the committee would go and address gatherings of the profession and endeavour to bring them to realize the necessity for organization. Finally, a committee was instructed to formulate the changes that would be required in the existing constitution and by-laws of the Provincial Association in order to create a chain between the Dominion Association on the one hand, and the practitioners on the other, links in which would be the Provincial Association and the local society. This committee, after much work, sent down to some forty local societies throughout the province the scheme of reorganization, and this, in its final and revised form, will come before a special meeting of the Association to be held this fall. The scheme, briefly, is that local societies shall be established throughout the province, and the only road by which any practitioner may gain admission to the Provincial Association, and through it to the Dominion Association, shall be by membership in his own local society. In this way a practitioner is responsible for his conduct to the men who are practising around him, and they are the ones who pass upon his qualifications for membership—first, in the local society; second, in the Provincial, and third, in the Dominion. The Provincial Association shall be managed by a committee of general purposes, composed of delegates from the various local societies, upon a fixed basis of representation, namely: The president and one delegate from every society of fifty members or under, and one additional delegate for any portion of fifty in addition to the original fifty.

Recognizing that the formation of local societies will require an active campaign, and the duties of the secretarial office will be greatly increased, the Association demands a fee of $2.00 per year from every member of the local societies who seeks enrolment in the Provincial, and, at the same time, relinquishes its claim upon the Dominion Association treasury for any rebate upon the Provincial membership in the Dominion Association.

There are, of course, a number of other changes in the original constitution of the Provincial Association, but they are necessary to the working out of the scheme and, beyond what is stated above, are of no vital importance outside of the province.

The necessity for a resolute endeavour to arouse the profession throughout the province to the requirements of the situation, has been pressed upon the thinking members of the profession through various questions of public import, which have arisen of late, affecting the profession. There is the Workmen's Compensation Act, an act vitally affecting a great proportion of the members of the profession in that it arranged a form of national insurance against accident and compelled the formation of a fund into which workmen and employers alike paid. This Act was drawn up at first without much consultation with the profession and the result has been that a large committee of medical men have been engaged with the Government in the preparing of amendments to the original Act, which are being brought into operation this summer and which aim to give a fair remuneration to the medical men who are called in to attend workmen when they meet with accidents. The appointment of a Medical Commission by the Ontario Government to enquire into medical education, the rights (?) of chiropractors, osteopaths, Christian scientists, mano-therapists, etc., etc., to practise under the Medical Act, etc., etc., at once made a demand upon the profession to state the reasons for its existence, its ideas with regard to educational qualifications, etc., and it was found that there was no organization qualified to do more than to speak for a small proportion of the profession.

There are numerous other public questions upon which the profession has a right to be heard, and its united opinion pressed upon the public and the Government, such questions as the Adulteration of Foods Act, the Health Legislation, Patent Medicines, etc.

The scheme of reorganization of the Ontario Medical Association resembles that of the American Medical Association more than that of the British Medical Association but it was felt that the former was better calculated to meet the needs of the situation —modified, of course, to suit our differing conditions.

Yours sincerely,

D. J. Gibb Wishart,

Chairman, Committee of Revision.

Book Reviews

EMERGENCY SURGERY. By JOHN W. SLUSS, A.M., M.D., F.A.C.S., associate professor of surgery, Indiana University School of Medicine. Fourth edition, revised and enlarged. 827 pages with 685 illustrations, some of which are printed in colours. Publishers: P. Blackiston's Son & Co., 1012 Walnut Street, Philadelphia. Price, $4.00 net.

THE present volume by Dr. Sluss is the fourth edition within a very short time, a fact which sufficiently attests its popularity. The book obviously fills a want which has been particularly felt by the general practitioner. The only book that we know of of late years devoted to this particular field is that of Lejars, of Paris, which was translated into English a few years ago and had a large sale. Lejars book, however, is too lengthy and cumbersome for the purpose of the general practitioner who finds himself in an emergency. In this respect Sluss' book is an excellent compendium. It is full enough, and yet concise enough. The illustrations are numerous; there is one for almost every page, and on the whole they are excellent, although quite a few of them, adapted from older text-books, are, according to our present day standard, a trifle crude. The subject matter is presented in good concise English, though without pretence to style. One is inclined to take issue with certain statements; for instance, in speaking of the treatment of appendicitis the author advises, where pus is expected, an incision which cuts through the internal oblique across its fibres. Nowadays there are practically no cases of appendicitis that need the cutting of muscle with consequent tendency to hernia.

There is a great deal of useful information given in a concise way, and of value, not only to the general practitioner, but to the surgeon, particularly concerning the rarer emergencies, such as, wounds of the heart, œsophogotomy, etc. As usual in such books, there is given a great deal more than properly comes under the head of "emergency surgery". For instance, the treatment of cold abscess (page 394) can hardly be called an emergency; the same is perhaps true of furuncle of the face. However, this is perhaps hypercritical. There are a couple of good chapters on wounds of the war, which, however, are already partly out of date; for example (when one remembers the long and precise directions that Carrel recently put forth), the instructions for making Dakin's solution are dreadfully abbreviated.

One might go through the book and pick out a great many things to approve, and a few things to condemn, but space forbids. On the whole the book is cordially to be recommended.

THE PRACTICAL MEDICINE SERIES. Vol. VI. GENERAL MEDICINE, edited by FRANK BILLINGS, and others. Series 1916. Chicago, The Year Book Publishers, 327 LaSalle Street. Price, $1.50.

In the present volume the subjects of infectious diseases, diseases of the mouth and œsophagus, of the stomach, of the intestines, of the liver and gall bladder, and of the pancreas, are reviewed. The volume contains 340 pages and has an excellent index. It maintains the high reputation long since acquired by this series of year books. The reviews are well done and the newer things are well selected. It is to be recommended.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

THE PRACTICAL MEDICINE SERIES; Comprising ten volumes on the Year's Progress in Medicine and Surgery. Under the editorial charge of CHARLES L. MIX, A.M., M.D., professor of physical diagnosis in the Northwestern University Medical School. Vol. I, GENERAL MEDICINE. Edited by FRANK BILLINGS, M.S., M.D., head of the Medical Department, and Dean of the Faculty of Rush Medical College, Chicago. Price, $1.50. Vol. II, GENERAL SURGERY. Edited by ALBERE J. OCHSNER, M.D., F.R.M.S., LL.D., F.A.C.S., surgeon-in-chief Augustana and St. Mary of Nazareth Hospitals. Series, 1917. Chicago, The Year Book Publishers, 608 S. Dearborn Street. Price,$2.00.

IMPOTENCY, STERILITY, AND ARTIFICIAL IMPREGNATION. By FRANK P. DAVIS, PH.B., M.D., Fellow American Medical Association. Publishers: C. V. Mosby Company, St. Louis, 1917.

FOOD POISONING. By EDWIN OAKES JORDAN, chairman of the Department of Hygiene and Bacteriology, the University of Chicago. Price, $1.00 net. The University of Chicago Press, Chicago, 1917.

ASTHMA: PRESENTING AN EXPOSITION OF THE NONPASSIVE EXPIRATION THEORY. By O. H. BROWN, A.B., M.D., PH.D., formerly assistant professor of medicine, St. Louis University. 322 pages with 36 engravings. Price $4.00. Publishers: C. V. MOSBY Company, St. Louis, 1917.

EXPERIMENTAL PHARMACOLOGY. By DENNIS E. JACKSON, PH.D., M.D., associate professor of pharmacology, Washington University Medical School, St. Louis. 536 pages with 390 original illustrations including 24 full page colour plates. Price $4.00. Publishers: C. V. Mosby Company, St. Louis, 1917.

Obituary

DR. THOMAS DYSON WALKER

DR. THOMAS DYSON WALKER, one of the leading physicians of St. John, N.B., died in the Massachusetts General Hospital on July 22nd. Dr. Walker, owing to failing health, had been compelled to spend the last few winters in a warmer and more genial climate, but when the weather moderated he always returned to St. John where he did active service on the surgical staff of the St. John General Hospital. He held office on several occasions in the New Brunswick Medical Association and was a past president of the St. John Canadian Club. When the 8th Field Ambulance was first organized in St. John, many years ago, Dr. Walker took an active part in its formation, and became a member of its staff, continuing his connexion with the corps until he attained the rank of lieutenant-colonel. Ill health prevented him from going overseas, but last year he served as commandant of the hospital at the Aldershot training camp. He is survived by his parents, three sisters and three brothers. One of his brothers is now in charge of No. 9 Overseas Heavy Siege Battery, another, Dr. William Dacre Walker, is practising in Andover, Mass., and a third is connected with the Canadian Bank of Commerce. Dr. Thomas Walker, his father, has held a foremost position among the profession of St. John for the past forty years.

A hospital colleague sends the following appreciation:

Dr. Walker, after an Arts course at the University of New Brunswick and a medical course in Edinburgh, entered upon the practice of his profession in his native city in 1891. In that year he was elected to the visiting staff of the General Public Hospital and served the institution continuously until the time of his death. Very early in his career he showed a marked leaning toward the practice of surgery and as time passed came more and more to be recognized as an authority in that department, and on the creation of the American College of Surgeons was honoured with a charter fellowship. An active member of our medical societies, Dr. Walker was a profound student and never neglected an opportunity, by travel and observation, of widening and deepening his experience. He was greatly beloved by all who knew him, and rightly so; for he brought to the discharge of his duties not only a well-trained mind but a tender sympathetic heart. By the death of Thomas Dyson Walker the profession of medicine in St. John has lost one of its most brilliant members and the community a public-spirited and useful citizen.

CAPTAIN JAMES HENDERSON, R.A.M.C.

Captain Henderson died of tuberculosis, at his parents' residence, in Toronto, on Tuesday, July 17th. After graduating from the University of Toronto, where he obtained his medical degree in 1900, Captain Henderson saw service in the South African war and upon the declaration of peace returned to Canada and went into practice at Warren in the province of Ontario. From Warren he went to Sudbury and while there he made many long journeys to lumber camps and often underwent great hardships, on one occasion being found unconscious and badly frozen. Dr. Henderson afterwards removed to Regina where he was in practice when war was declared. He joined a medical corps and went to Valcartier but the state of his health made it necessary for him to return to Regina. Six months later, however, accompanied by his wife, he sailed to England, joined the Royal Army Medical Corps, and became a member of the Expeditionary Force that was sent to the relief of General Townsend at Kut-el-Amara. Unfortunately his health broke down again and he was admitted to St. George's Hospital, at Bombay. From there he was transferred to England and later returned to Canada. Captain Henderson was a keen sportsman and had made many friends in the West. He was possessed of an undaunted spirit and in spite of impaired health was eager to serve his country.

Dr. Robert Thomas Adam, of Lindsay, Ontario, died at Gravenhurst Sanitarium, on July 28th, after a long illness, at the early age of thirty-three years. He was a graduate of the Lindsay Collegiate Institute and the University of Toronto where he obtained his medical degree in 1907. Dr. Adam served as medical officer on one of the Canadian Pacific Railway liners sailing from Vancouver to the Orient for some time and afterwards practised at Millbrook, Ontario.

Dr. John Alexander McGuire, physician at the Stony Mountain Penitentiary, died at the Winnipeg General Hospital, on July 31st, in the fifty-ninth year of his age. Dr. McGuire was born in New Brunswick and, in 1882, went to Manitoba to teach in the Stony Mountain School. After teaching for some years, he entered the medical school of the University of Manitoba where he graduated in 1895. He was appointed surgeon of the penitentiary in 1911.

Dr. Bean, of Consecon, Ontario, lost his life in an attempt to rescue his wife and child from a burning house. He had recently opened a practice in Consecon and on the morning of August 8th had apparently been awakened by the fire and had escaped from the house. It is surmised that he returned to the burning building to rescue his wife and child. Mrs. Bean is not expected to recover but it is hoped that the child will get well. Dr. Bean was only thirty years of age.

Dr. E. L. Fuller, of Amherst, Nova Scotia, died July 1st, after a long illness. He was born of Canadian parentage in Northampton, Massachusetts, and had practised in Amherst for about thirty-five years.

Dr. A. Henri Laplume, of Montreal, died July 21st, in the twenty-ninth year of his age. Dr. Laplume was educated at the Montreal College and graduated from Laval University in 1913. He was house surgeon at the Hôtel Dieu and the St. Justine Hospital.

Dr. Archibald McTavish died at the Amasa Wood Hospital, St. Thomas, Ontario, on August 1st, in the eighty-second year of his age. Dr. McTavish was born in North Yarmouth and practised for a number of years at Staffa. He leaves three sons, one of whom is the editor of the *Canadian Magazine*.

Dr. J. O. Orr, of Toronto, died August 22nd. He had been in failing health for some time and had recently been granted a year's leave of absence by the directors of the Canadian National Exhibition, of which he had been manager for the past thirteen years. Joseph Orlando Orr was born at Toronto, in 1861. He graduated in medicine from the University of Toronto in 1884 and completed his medical studies at King's College, London. Dr. Orr was the founder of the Toronto Technical School, a member of the city council from 1890 to 1894, and a trustee of the General Hospital.

News

MARITIME PROVINCES

Dr. A. E. Macauley, superintendent of the General Hospital at St. John, New Brunswick, has resigned.

The following candidates successfully passed the examinations of the Council of Physicians and Surgeons of New Brunswick in June last: Drs. H. S. Clarke, H. Hedden, J. G. Langis, A. T. Leatherbarrow, E. W. Lunner, and J. R. Nugent.

The sum of one thousand dollars has been advanced by the municipal council of Westmoreland, New Brunswick, to the Moncton hospital, in view of the increased cost of maintenance.

Dr. A. B. Atherton, formerly of Fredericton, New Brunswick, has retired from practice and is now living at San Diego, California.

QUEBEC

Captain A. H. Hall, who was wounded in France some months ago, has returned to Canada and taken up practice again in Quebec.

ONTARIO

A fine of $100 was imposed, on August 13th, upon a Toronto doctor for violation of the Temperance Act. The defendant pleaded guilty to two charges of issuing prescriptions for intoxicants which were not required for medicinal purposes.

It is proposed to erect a hospital at Orillia as a memorial to the soldiers from that town who have fallen in battle. It is estimated that the proposed hospital will cost about $75,000 and it is probable that a by-law to raise one third of this amount will be submitted to the ratepayers.

Dr. Hastings, the medical officer of health, has been instructed by the Toronto Board of Health to draw up regulations for the control of venereal diseases in that city.

Dr. M. B. White has been appointed director of medical services under the Toronto Board of Health. Dr. White will thus have charge of the medical inspection of schools, which was recently transferred from the Department of Education to the Board of Health.

MANITOBA

The Brandon Hospital for the Insane is to be enlarged. It is probable that patients at present in the asylum who are not actually insane will be removed to Selkirk, while insane patients now at Selkirk will be taken to Brandon.

SASKATCHEWAN

A municipal hospital is in course of construction at Shaunavon. Hospitals are also to be built at Lanigan and Swift Current.

Dr. R. G. Ferguson, of Winnipeg, has been appointed medical superintendent of the Qu'Appelle Sanitarium pending the return of Dr. Hart, who is on active service.

BRITISH COLUMBIA

At a meeting of the Trades and Labour Council at Victoria, on August 1st, the question of the choice of a physician in cases of accident was discussed. Employees were assured that, under the Workmen's Compensation Act, they had the right to choose a doctor to attend them and that they were not obliged to have the physician chosen by the employer.

During the past twelve months 1,451 patients have been treated in the Royal Columbian Hospital at New Westminister, at an average cost of $1.73 a day for each patient. The number of hospital days was 28,920. The financial statement for the year showed a deficit of $3,401.27.

Several business matters were discussed at a meeting of the Board of Directors of the Vancouver General Hospital on August 2nd. Outstanding accounts to the amount of $75,000 are now on the books of the hospital and every effort to collect these accounts has been unsuccessful. It was decided, therefore, to place all overdue accounts up to December 31st, 1916, in the hands of a solicitor for collection. The members of the Board thought that Dr. McEachern, the medical superintendent, ought to be relieved of some of the business responsibility and, accordingly, it was decided that a clause should be added to the by-laws to provide that business matters should be placed entirely under the direction of the managing secretary, whose approval must be obtained in connexion with all matters involving the expenditure or collection of money.

MEDICAL COLLEGES

McGill University

Dr. F. W. Nagle, lecturer in anæsthetics at McGill University, was elected president of the American Association of Anæsthetists at the fifth annual meeting of that Association.

ARMY MEDICAL SERVICES

THE Military Cross has been conferred by His Majesty the King upon the following members of the Army Medical Corps:

CAPTAIN OTTO DEMUTH, of Grand Forks, British Columbia. The London *Gazette* states: "Whilst attending to the wounded under heavy fire, Captain Demuth's initiative and total disregard of danger enabled the evacuation of the wounded to be carried out successfully during a very trying period. No personal danger seemed too great for him to face in the performance of his duties." Captain Demuth went overseas as a private with the McGill General Hospital and before leaving England was promoted to the rank of sergeant. He was awarded his degree in medicine from McGill University in 1915, and was subsequently given a commission in the R.A.M.C. and sent to Malta. There he contracted typhoid fever. Upon his recovery he was placed in charge of an artillery group training in England and later went to France as medical officer of an Australian brigade of heavy artillery. He was wounded at the battle of the Somme a year ago and was invalided home. He returned to England, however, and from there went to France, where he was wounded the second time.

CAPTAIN GORDON ARCHIBALD MACPHERSON, C.A.M.C., for "devotion in collecting wounded".

CAPTAIN ARCHIBALD MCCAUSLAND, C.A.M.C., for "dressing wounded under a heavy fire".

LIEUTENANT LANCELOT LLEWLLYN JOHNSTON, C.A.M.C., for "collecting wounded, although himself wounded".

LIEUTENANT DOUGLASS MILLER MARSHALL, C.A.M.C., for "clearing wounded from an isolated post".

LIEUTENANT FRANK GORDON PEDLEY, R.A.M.C., son of Rev. Hugh Pedley, D.D., of Montreal. Lieutenant Pedley went to a dugout hit by shell fire and saved the lives of many of the occupants. He later went through a heavy barrage to attend a badly wounded officer, whom he eventually brought back to the dressing station. On both occasions he displayed the utmost gallantry and disregard of danger. While in his fourth year in medicine at McGill University, Lieutenant Pedley went overseas with the McGill Hospital and about a year later returned to complete his course. Upon graduation he returned to England and was given a commission in the Royal Army Medical Corps.

TEMPORARY CAPTAIN DONALD ALEXANDER WARREN, R.A.M.C. "For conspicuous gallantry and devotion to duty. He continued to attend wounded for over an hour under heavy artillery and machine gun fire and in full view of the enemy. Later he established an outpost and carried on for forty-eight hours without rest under continuous fire."

CAPTAIN (ACTING MAJOR) HAROLD BUCK, C.A.M.C. "For conspicuous gallantry and devotion to duty. He led his bearers with great gallantry, and was responsible for the evacuation of a large number of wounded men. He set a fine example to all ranks."

CAPTAIN ALVA BURTON CHAPMAN, C.A.M.C., of Winnipeg. "For conspicuous gallantry and devotion to duty. One of our planes being shot down he went to the assistance. On his way he was wounded in the head. He continued on his way to the machine, which was being heavily shelled, attended to one of the occupants, and had him carried away."

CAPTAIN WARING GERALD COSBIE, C.A.M.C., of Toronto. "For conspicuous gallantry and devotion to duty. He led his bearers into the open under heavy fire, and rescued many wounded men. He worked continuously for forty-eight hours under very heavy fire."

CAPTAIN WILLIAM CREIGHTON, C.A.M.C., of Winnipeg. "For conspicuous gallantry and devotion to duty when in charge of an advanced dressing station. He took command of a party and searched for wounded for six hours under heavy shell fire, bringing in all our wounded as well as those of the enemy. His gallantry was most inspiring to his men."

CAPTAIN WILLIAM HALE, C.A.M.C., of Toronto. "For conspicuous gallantry and devotion to duty. He established a dressing station in a forward area, and worked untiringly for sixty hours under fire, dressing the wounded. He set a fine example of courage and determination."

CAPTAIN EDWARD SHAPTER JEFFREY, C.A.M.C., of Toronto. "For conspicuous gallantry and devotion to duty. Under continuous shell fire he directed and steadied the stretcher parties. His fine example and courage enabled all wounded to be cleared before nightfall."

CAPTAIN RICHARD WELLINGTON KENNY, C.A.M.C., of Winnipeg. "For conspicuous gallantry and devotion to duty. He unceasingly attended wounded in his dressing station. He improvised an additional station in an adjacent trench and carried on his work under shell fire. He has done previous good work in the same capacity."

Captain Charles Kerr, C.A.M.C., of Winnipeg. "For conspicuous gallantry and devotion to duty, when in charge of regimental aid posts. He continually exposed himself to heavy fire, with the result that every wounded man was cleared as soon as his wounds were dressed. He has on several occasions shown most unselfish devotion in the care of wounded."

Captain Hugh Roy Mustard, C.A.M.C., of Victoria. "For conspicuous gallantry and devotion to duty in dressing the wounded of a battery in the open, exposed to heavy shell fire, for two hours. He then continued at an exposed post for three days dressing wounded, and he has on several occasions exhibited great courage and devotion of the same kind."

Captain Donald George Kennedy Turnbull, C.A.M.C. "For conspicuous gallantry and devotion to duty. He showed continual fearlessness and splendid devotion in making his way under the heaviest fire to the most advanced parts of the battlefield to establish dressing stations and attend to the wounded. No undertaking seemed too perilous for him; he constantly dressed wounded in the front line, and the example he set to his stretcher bearers and carrying parties was at all times beyond all praise.'

Major W. Turner, C.A.M.C.

Captain H. Argue, C.A.M.C.

Captain Frank M. Walker, R.A.M.C., of Stoney Creek, Ontario. "For gallantry and devotion while under heavy fire." Captain Walker graduated from the University of Toronto in 1913.

Lieutenant-Colonel W. Webster, C.A.M.C., was recently invested with the D.S.O. and bar by His Majesty at Buckingham Palace.

The following members of the Canadian Army Medical Corps were recently mentioned in despatches from general headquarters at Salonica: Lieutenant-Colonel W. B. Hendry, Lieutenant-Colonel E. J. Williams, Major C. S. McVicar, Major H. C. Parsons, Captain W. A. Clark, Captain J. E. Campbell, Captain J. G. Johnson, and Quartermaster J. Middleton. Nursing Sisters Lumsden, Matheson, Huston, Christie, Brock, McEachern, Gamble, McCullough and Morrison.

Captain Frank Park, C.A.M.C., who was taken prisoner by the Germans in June, 1916, was attached to the 4th Canadian Mounted Rifles. He was taken to the Officers' Prison Camp, at Gutensloh, but asked permission to attend the allied prisoners at the Minden Hospital, where there are two thousand prisoners. His request was granted and for some months now Captain Park has been acting as medical officer at the hospital, where he is the only British officer.

Lieutenant-Colonel J. R. Spier, C.A.M.C., is in command of the Canadian Convalescent Hospital at Bromley, England.

Lieutenant-Colonel S. **Hanford McKee**, C.A.M.C., of Montreal, is in temporary command of the Westcliffe Hospital, England, during the absence of Colonel J. D. Courtenay, C.A.M.C., who is on leave.

Captain H. A. **Simpkins**, C.A.M.C., has been transferred from the medical staff of the Spadina Convalescent Home, Toronto, to London, England.

Captain L. J. **Siebert**, **Captain** H. D. **Livingstone**, and **Lieutenant** J. M. **McDonald**, of the C.A.M.C., have left for China.

Dr. L. de L. Harwood, superintendent of the Notre Dame Hospital, Montreal, has left Canada to join the staff of the Laval General Hospital.

Captain J. R. **Goodall**, C.A.M.C., of Montreal, has been appointed deputy assistant director of medical services at Shorncliffe.

Lieutenant-Colonel D. **King Smith**, C.A.M.C., of Toronto, is home on leave after an attack of fever. Lieutenant-Colonel Smith has been on duty at Salonica with the Toronto General Hospital.

Major A. W. **Macpherson**, C.A.M.C., medical officer of health of Peterborough, returned to Canada at the beginning of August on two months' leave. Captain S. Burns, C.A.M.C., of Hamilton, was also home recently.

Captain A. L. McQuarrie, C.A.M.C., has been appointed officer commanding Canadian sanitary section No. 7, in England, with jurisdiction over the Bramshott area as far as contagious diseases and sanitary matters are concerned. Captain McQuarrie, who was medical officer of health of New Westminster, British Columbia, went overseas with the 121st Battalion as regimental medical officer.

The Brant Park Hotel at Burlington Beach, near Hamilton, is to be converted by the Military Hospitals Commission into a hospital for wounded soldiers.

Lieutenant Ronald Neil Stuart, V.C., D.S.O., R.N.R., who was selected by his fellow officers to receive the Victoria Cross for services in action with enemy submarine, is a Prince Edward Islander.

Major H. E. Paul, C.A.M.C., of Fort William, Ontario, is in command of the Canadian Hospital at Etchinghill, Kent, England. Members of the staff are: Captain H. K. Bates, of Toronto; Captain G. O. Scott, of Ottawa; Captain A. M. Yeates, of London, Ontario; Captain J. G. Gunn, of Aisla Craig, Ontario; Captain W. T. Lockhart, of Carnduff, Saskatchewan; Captain B. F. Steeves, of Claresholm, Alberta; Captain A. B. Jackson, of Simcoe, Ontario; Lieutenant A. V. Greaves, of Toronto; Captain M. W. Lawton, of Saskatoon, quartermaster; Captain A. L. Skerry, of Stanley, New Brunswick, chaplain; Lieutenant H. B. Boreham, of Fort William, Ontario, adjutant.

The following officers are on the staff of the Kitchener Military Hospital at Brighton, England, which is the only Imperial hospital that is staffed exclusively by Canadians: Lieutenant-Colonel A. T. Shillington, C.A.M.C., of Ottawa, officer-in-command. Lieutenant-Colonel W. McKeown, of Toronto, second-in-command and head of the surgical department; Major Philip Burnett, D.S.O., of Montreal; Major D. A. Whitton, Major W. H. Macdonald; Captain G. C. Hale, of Toronto, head of the medical department; Captain Fleming, adjutant; Captain J. H. Slater, Captain N. T. Beeman, Captain C. D. Rilance, Captain C. A. Thrush, Captain R. N .W. Shillington, Captain A. J. B. Herbert, Captain K. C. W. Dean, Captain O. Morris, Captain W. N. Cochran, Captain

J. T. W. Boyd, Captain G. W. Leach, Captain C. A. Temple; Captain D. M. Lineham, Captain T. A. Watterson, Captain O. S. Waugh, Captain W. F. Hale, Captains J. O. Watts and C. R. Spencer, chaplains; Captain J. J. Thompson, registrar; Captain E. T. Curran, Captain W. H. Brown, Captain F. C. Campbell, Captain H. A. Sims, Captain J. L. Walker, Captain S. G. Mills, Captain R. Kirkpatrick, quartermaster; Captain J. Lewin, assistant quartermaster; Captain H. A. McComb, paymaster; Captain E. C. Cosstick, assistant paymaster and Captain C. H. Fowler, C.A.D.C., dental officer.

CAPTAIN W. B. McDERMOTT, C.A.M.C., is on duty with the Anglo-Russian Red Cross Hospital.

PROMOTIONS in the C.A.M.C.—To be temporary Captains: Temporary Lieutenants S. G. Graham, M.D., A. J. Ireland, M.D., W. S. Foote, M.B., R. J. Snider, M.B., G. W. Armstrong, M.B., W. B. Rutherford, M.B., G. Scullard, M.B., P. W. M. Curry, M.B.

THE Government House at Charlottetown, Prince Edward Island, has been offered by Lieutenant-Governor MacDonald to the Military Hospitals Commission as a convalescent hospital for returned soldiers.

DR. CLARENCE J. A. McKILLOP, of St. Thomas, Ontario, has been appointed Surgeon with the Royal Navy. Dr. McKillop graduated with honours from Western University about six months ago.

LIEUTENANT W. S. SMITH, R.A.M.C., of Kingston, Ontario, who, after serving in France and at Salonica, was invalided home some months ago suffering from rheumatism, has been given a commission in the C.A.M.C. and has returned to England.

A CANADIAN hospital has been established in Liverpool to which invalid and wounded soldiers will be sent on their way to Canada. The hospital will thus serve as an assembly centre for soldiers who will be given further treatment on their arrival in this country. Cases of sickness which develop during the voyage from Canada to England will also be sent to the Liverpool hospital. The officer in command is Lieutenant-Colonel J. L. Biggar, C.A.M.C., who went overseas with the 13th Field Ambulance from Victoria, British Columbia. Other members of the staff are: Major T. H. MacDonald, C.A.M.C.; Captain M. G. Thompson, adjutant; Captain H. A. W. Brown, C.A.M.C.; Captain A. B. Walters, C.A.M.C.; Captain W. C. Burns, C.A.M.C.; Lieutenant W. G. Robertson, R.A.M.C., and Lieutenant Haylett, quartermaster. The hospital buildings were formerly known as the Kirkland Homes.

DR. WILMER DENNY, who graduated in medicine from Western University a few months ago, has obtained a commission as medical officer in the Royal Navy.

CAPTAIN ANDREW MACPHAIL, C.A.M.C., editor of the JOURNAL, has been promoted to the rank of Major and has been appointed to take charge of the third Canadian medical department in London. Major Macphail has been attached to Canadian Medical Headquarters since June.

CASUALTIES

Killed in Action

CAPTAIN LEWIS EMERSON CLARK, M.D., C.A.M.C., of Vancouver. Captain Clarke, who was twenty-nine years of age, graduated from McGill University in 1913.

Died of Wounds

CAPTAIN CLAUDE TREHERNE, R.A.M.C.

Died

NURSING SISTER SARAH ELLEN GARBUTT, of Oshawa, Ontario.

NURSING SISTER ETTA SPARKS, of Britannia-on-the-Bay, Ontario.

Gassed

LIEUTENANT-COLONEL A. S. DONALDSON, C.A.M.C., of Brockville, Ontario.

Wounded

Captain J. H. Jones, C.A.M.C., of Brockville, Ontario.
Captain R. D. Mackenzie, C.A.M.C.
Captain R. W. Kenny, M.C., C.A.M.C.
Captain J. E. Bloomer, C.A.M.C., of Basswood, Manitoba.

Canadian Literature

Original Contributions

The Public Health Journal, April, 1917:

The problem of illegitimacy—the general practitioner's point of view . .	W. F. Clark.
Illegitimacy—the attitude of the social worker	Miss M. J. Kniseley.
The nurse midwife	F. J. Taussig.
A survey of the spreading health insurance movement	I. M. Rubinow.
The principles of sewage treatment . .	J. Russell Ellis.
Infantile increase and child conservation .	H. B. Weston.

The Canada Lancet, April, 1917:

Incidents in the life of a physician . .	Sir James Grant.
Points on general anæsthesia for the surgeon	S. Johnston.
Pituitary extract in pregnancy and labour	K. C. McIlwraith.

The Canadian Journal of Medicine and Surgery, July, 1917:

The Presidential Address, Ontario Medical Association	A. Dalton Smith.

The Canadian Practitioner and Review, July, 1917:

Some observations on the use of diuretics in nephritis.	H. A. Christian.
The use of radium in internal medicine.	F. Arnold Clarkson.

Dominion Medical Monthly, July, 1917:

The Presidential Address, Ontario Medical Association	A. Dalton Smith.
Trench shin an infectious febrositis	G. Chambers.

The Canada Lancet, July, 1917:

Some observations on the use of diuretics in nephritis	H. A. Christian.
The established value of radium as a therapeutic agent	W. H. B. Aikins.
False systems of healing. No. 1, Christian Science	J. Ferguson.

The Public Health Journal, July, 1917:

Poliomyelitis	H. W. Hill.
Clinical studies of infantile paralysis	E. J. Durocher.
Public health in the average town: Ways and means of conducting	C. A. Patterson.
Practical points in the enforcement of regulations and the difficulties of the medical officer of health	H. Ross.
How can a rural municipality employ a public health nurse?	J. F. Hanly.
Overcrowding—Why is it tolerated?	T. Watson.

Medical Societies

SASKATCHEWAN MEDICAL ASSOCIATION

The tenth annual convention of the Saskatchewan Medical Association opened in Saskatoon on the morning of July 17th, Dr. R. Holden Love, of Saskatoon, being in the presidential chair. About sixty members were in attendance.

Dr. M. M. Seymour, commissioner of public health, spoke of the importance of administering antitoxin in cases of diphtheria if possible on the first day of illness, and Dr. S. H. Corrigan, of Lampman, gave an interesting account of "Obstetrical difficulties in country practice". The afternoon session was opened by Professor Boyd, of the University of Manitoba, whose subject was "Vaccines, their use and abuse". This paper was followed by one on "Uterine hæmorrhages at the period of the menopause", by Dr. F. A. Corbett, of Regina. Dr. Mathers, of Winnipeg, gave an interesting paper on "Chronic indigestion". In the evening the members were taken on an automobile drive through the city, which was followed by the annual banquet, at which Dr. H. D. Weaver, president of the Saskatoon Medical Society, presided. During the course of the evening Dr. Rutherford proposed the toast to the Empire, which "stood and fought for the ideals of human liberty and freedom". Speaking of the contribution made by Canada during the present war, Dr. Rutherford referred to the spirit of comradeship that had arisen amongst the troops from the various Dominions, a comradeship that would endure long after the war was over. Dr. Dakin, replying, said that the word Empire had gained significance since the war, whereas it had been previously merely an abstract thing to the average Canadian. In speaking on the toast to "Our Country", Dr. J. R. Macdonald said that whereas the Roman Empire had comprised one hundred and twenty million people the population of the British Empire was four hundred million. Canadians were proud of their part in the Empire and were proud of the men who had gone overseas to sacrifice their lives for those at home. He thought that the national consciousness should be aroused; too little pride was taken by Canadians in their country and he thought this was due to the fact that education was provincial rather than national. Dr. Wordell said there had been three great aristocracies in the world, the Greek aristocracy of the intellect, the aristocracy of birth in Europe, and the aristocracy of wealth in the United States. He would like to see in Canada an aristocracy of service.

The next day the first part of the morning was devoted to clinics in the General Hospital under Dr. A. L. Lynch, and in St. Paul's Hospital under Dr. G. R. Peterson. These were followed by a series of motion pictures shown in the Victoria Theatre, which depicted operations by Drs. Albee and Erdman of New York, and Dr. Howard Kelly, of Baltimore. It was the first time that the films had been exhibited in this country and they were watched with the greatest interest.

As the afternoon session a number of interesting papers were read, the first being by Dr. V. Black, of Moose Jaw, entitled "Appendicitis, when to operate." Dr. W. A. Dakin, superintendent of hospitals at Regina, speaking on the subject of "Municipal hospitals" pointed out the importance of standardizing the buildings and equipment of these hospitals. Dr. Harold Alexander, of Saskatoon, gave a paper on "Gastric lesions", which was accompanied by lantern demonstrations.

The officers elected for the year 1917-1918 were: Honorary president, Dr. Turnbull, of Moose Jaw; president, Dr. Graham, of Swift Current; first vice-president, Dr. V. Black, of Moose Jaw; second vice-president, Dr. Macmillan, of Prince Albert. Executive committee: Dr. Bawden and Dr. Wordell, of Moose Jaw; and Dr. Stewart, of North Battleford.

THE MONTREAL MEDICO-CHURURGICAL SOCIETY

The twelfth regular meeting of the society was held Friday, March 16th, 1917, Dr. W. S. Morrow, president, in the chair.

Pathological Specimens: Series by Dr. Horst Oertel.

1. This first specimen shows a rather unusual result of a septic thrombo-arteritis of the brachial artery. It concerns a woman confined five days before she developed symptoms of puerperal sepsis followed by a septic thrombosis of the right brachial artery. As a result sloughing of the arm and hand occurred below the thrombus in the form of an unusual and very complete, connected, desquamation of the skin over the whole hand and fingers, almost of glove-like shape and appearance. After treatment by multiple incisions, which, by the way, led to discovery of the thrombosis in the brachial artery, the woman made an uninterrupted recovery.

2. The second specimen is a tumour of the ovary which I present especially for the purpose of emphasizing the limitations of pure histological diagnosis in surgical specimens. There is perhaps not another organ which offers so many difficulties in the question of malignancy as the ovary in its growths. And these difficulties are accentuated when only parts of these are submitted for microscopic examination. I refer particularly to the papilliferous cystadenomata of the ovary. These are not at all infrequent pelvic tumours in females and they are made up of multilocular small and large cysts filled by a characteristic secretion of the so-called pseudo-mucin. Now it is at times difficult to decide from the histological picture alone whether we are dealing with a progressive, malignant tumour or with a strictly local benign tumour.

In this case we were anatomically unable to decide the question whether, in any way, the tumour conformed in greater degree to the criteria of benign growths. It was well limited, although partly adherent to surrounding structures of the pelvis and it consisted of well developed, mostly small mucoid cysts. Microscopically it does not display any of the features which we consider usually characteristic of malignancy. There does not exist excessive or irregular proliferation of the lining epithelium, no particular active or pronounced papillomatous growth into the cyst cavities; the cells themselves appear not atypical; they form only one well developed, lining layer on a basement membrane through which they do not break inside or outside of the cyst. They are a high, mucin-secreting, cylindrical epithelium. Between these cysts is a well matured, good looking, fibrillar connective tissue stroma. Histologically the tumour could therefore be regarded as benign. However, clinically, the growth behaved very differently. There, I am informed, it grows much beyond its own boundary; it has become attached to and invades and extends within the peritoneum. Biologically, therefore, the tumour carries the properties of an infiltrating malignant growth. This is a matter which is difficult to understand on simple histological grounds and features, but is not absolutely unknown to occur. As we learn more about tumours particularly of the genitals and of some of the ductless glands, we find that biological and morphological characters do not always go hand in hand and that, therefore, the diagnosis is not always expressed in morphological terms and methods of growth. It is true that a large number of them display grossly all necessary morphological evidences of malignancy; but there is an inconvenient number of others, and these are peculiarly interesting and misleading, which do not show these features, at least not as plainly as we expect. We must, therefore, be very careful in translating unhesitatingly histological terms into biological characters. Frequently specimens are submitted to the pathologist without any clinical findings, with the idea that it is not wise to prejudice or bias the opinion of the pathological anatomist. But it must be remembered that the histological findings are, like others, only evidence of unequal and relative value whose importance is, by no means, absolute; in themselves, therefore, they are not always of sufficient weight to determine the diagnosis.

Dr. Oertel's remarks were followed by a demonstration of the tumour, with slides.

Discussion: Dr. W. W. Chipman: What Dr. Oertel has said simply illustrates the truth that where we clinicians need the microscope most it very often fails us. This case was definitely clinically malignant. She was aged seventy and came into hospital suffering from an enlarged abdomen and more or less showed all the signs of a wasting disease. On opening, the whole peritoneal cavity was full of this gelatinous material. This cyst grew from the left side and showed that it had definitely previously ruptured. That is, although the acini were simply lined by this single layer of epithelium there must have been a penetration associated with this growth of the epithelium as the capsule was definitely transgressed to the extent of rupture. The whole peritoneal cavity was filled with this gelatinous material—much more than the cyst could have held—so that after its extrusion from the cyst, multiplications and increase must have gone on. In other words this material must have in itself life, and once fixed on any peritoneal surface it grows. The omentum was represented by a large discoid shaped mass, four inches thick, simply permeated with this growth. The stomach was connected to it, so were all the bowels and the parietal peritoneum swollen; the capsules of the liver and spleen were, to the touch, definitely thickened. Accordingly the growth is clinical but with all the ear marks of malignancy; it has within itself a low-grade vitality which enables it to perpetuate itself, to grow upon a serous surface. The whole point has been mentioned by Dr. Oertel when he says that mere morphology does not give the life history of a tumour, does not give its biology. It would follow that the biology of a tumour is after all the essential thing and that cannot be expressed in mere terms of morphology, that according to the microscope deals only with morphology, and in so far as it only does that it must of necessity fall short of clearing up the exact nature of any given tumour. Sometimes rather parallel and yet contradictory are those tumours of the appendix, the adenocarcinomata, which morphologically are definitely malignant and yet clinically are so often innocent. Dr. Keenan collected a series of tumours, the size of a cherry or plum, which definitely are morphologically malignant and yet clinically in so far as we are able to follow the history, are definitely innocent.

Dr. Oertel: I do not want to be misunderstood that the microscope is of no value in surgical diagnosis. It is of great value, but its importance is relative with the clinical evidence and not absolutely determining. I believe, therefore, with Dr. Chipman, that the morphology alone is at times, and unfortunately often, when we are most anxious to have definite information, insufficient for an accurate diagnosis. I myself, feel that I do not wish to make a surgical diagnosis on morphological grounds alone in the majority of cases which are submitted to me. Reliable clinical information, which really is biological observation, is most helpful, often essential, for reliable deductions. As far as these ovarian tumours are concerned we may perhaps differentiate them from the metastasing malignant tumours. They do not display the same high tendency to get into the lymphatics and blood vessels to be carried to different parts of the organism and there to set up tumour foci. They show, however, a great tendency to transplantation and that, probably, by the method which Dr. Chipman has described. The amount of mucoid material which is produced in these individual cysts becomes excessive, they are put under high pressure, possibly burst, and empty into the peritoneal cavity. With this cells become dislocated; they are readily transplanted to serous surfaces and in this way gradually progress and generalize by continuity and transplantation. Still it must be admitted that these tumours thereby become malignant, they destroy life, and although they may lack the power of true metastases, their method of spreading is as fatal.

As far as the tumours of the appendix are concerned it is very possible that a great many of these are not true tumours at all, but simply developmental dislocations of embryonic mucous membrane which has been isolated and, in the changed environment, retains morphologically a somewhat undifferentiated appearance, remaining embryonic gland tissue. Such foci need not grow, but may of course become later the starting point of tumours.

PAPER: The paper of the evening was read by Dr. A. H. Gordon who took as his subject, "A reason for symptoms," bringing out the fact that many physicians will not take the time thoroughly to examine their patients but will often accept the patient's diagnosis of "rheumatism", "run down," etc., and class many cases as "neurasthenia", when a thorough and painstaking examination would often reveal organic disease.

Medical Societies

CANADIAN MEDICAL ASSOCIATION:—President—Dr. A. D. Blackader, Montreal. President-elect—Dr. James McKenty, Winnipeg. Secretary-treasurer—Dr. J. W. Scane, 836 University Street, Montreal.

ACADEMY OF MEDICINE, TORONTO:—President—Dr. D. J. Gibb Wishart. Secretary—Dr. J. H. Elliot, 11 Spadina Road. Treasurer—Dr. J. H. McConnell.

ALBERTA MEDICAL ASSOCIATION:—President—Dr. W. A. Lincoln, Calgary. Secretary-treasurer—Dr. D. G. Revell, University of Alberta, Edmonton South.
Annual Meeting, Calgary, 1917.

ASSOCIATION OF MEDICAL OFFICERS OF THE MILITIA:—President—Lt.-Colonel A. T. Shillington, A.M.C., Ottawa. Secretary—Captain T. H. Leggett, A.M.C., Ottawa.

ASSOCIATION OF MEDICAL OFFICERS OF NOVA SCOTIA—President—Dr. George E. DeWitt, Wolfville. Secretary—Dr. W. W. Hattie, Halifax.

BRANT COUNTY MEDICAL SOCIETY:—President—Dr. E. R. Secord, Brantford. Secretary—Dr. M. N. Faris.

BRITISH COLUMBIA MEDICAL ASSOCIATION:—President—Dr. J. Glen Campbell, Vancouver. Secretary—Dr. H. W. Riggs, Vancouver.

CALGARY MEDICAL SOCIETY:—President—Dr. J. L. Allen. Secretary—Dr. J. E. Aikenhead. Treasurer—Dr. W. Shipley.

CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS:—President—Hon. J. W. Daniel, M.D., St. John. Secretary—Dr. George D. Porter, Ottawa.
Annual meeting, Ottawa, September 26th, 1917.

CANADIAN HOSPITAL ASSOCIATION:—President—Dr. H. A. Boyce, Belleville. Secretary—Dr. J. M. E. Brown, Toronto.

CANADIAN PUBLIC HEALTH ASSOCIATION:—President—Dr. J. D. Pagé, Quebec. Secretary—Dr. J. G. Fitzgerald, University of Toronto.
Annual meeting, Ottawa, September 27th and 28th, 1917.

CENTRAL SOUTHERN ALBERTA MEDICAL SOCIETY:—President—Dr. J. S. Murray, Okotoks. Secretary-treasurer—Dr. G. E. Learmonth, High River.

COLCHESTER-HANTS MEDICAL SOCIETY:—President—Dr. J. W. T. Patton, Truro. Secretary—Dr. H. V. Kent, Truro.

DUFFERIN MEDICAL SOCIETY:—President—Dr. Rooney, Orangeville. Secretary—Dr. Smith, Shelburne.

EDMONTON ACADEMY OF MEDICINE:—President—Dr. C. U. Holmes. Secretary-treasurer—Dr. E. L. Garner. Library, 12 Credit Foncier Building.

ELGIN COUNTY MEDICAL ASSOCIATION:—President—Dr. G. A. Shannon, St. Thomas. Secretary-treasurer—Dr. W. F. Cornett, St. Thomas.

FRASER VALLEY MEDICAL SOCIETY:—President—Dr. DeWolfe Smith. Secretary—Dr. D. F. Carswell.

HALDIMAND COUNTY MEDICAL ASSOCIATION:—President—Dr. Hopkins, Dunnville. Secretary—Dr. Courley, Cayuga, Ont.

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FROM THE VAGUE TO THE CONCRETE IN SCIENCE AND MEDICINE

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THERE are several examples in the history of science where an idea at first represented by some purely metaphorical expression became in course of time a concrete existence. Most of the sciences have instances of it; one meets at first with a notion, often of the vaguest, a principle, a property, a potentiality for something or other, and one ends with a substance, a species of matter, tangible and ponderable; the notion has become incarnated.

Inorganic chemistry offers us an excellent case of this sort of thing. When Lavoisier was working out the character of the substance we now know as oxygen, he had not isolated oxygen by a stroke of genius and then proceeded to study the properties of the new chemical product; the history of its discovery is far otherwise. Acting on some hints given him in October, 1774, by the Englishman, Joseph Priestly (1733-1804), Lavoisier (1743-1794), came upon what he soon named as the "principle of acids" or "the acidifying principle"; his own words are (1777):

"I shall therefore designate dephlogisticated air, air eminently respirable, when in a state of combination or fixedness, by the name of acidifying principle or if one prefers the same meaning in a Greek dress by that of *oxygine* principle."

Here it is a "principle", something which combines with metals when they are calcined or burned in air; it is that something which to Lavoisier seemed essential in acids, that which produced

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acidity, the oxygine principle. In its later and more familiar form of "oxygen", it is better etymologically. Now that which was a principle in 1777 was about one hundred and twenty years afterwards a visible, tangible entity—the liquefied, steel-blue oxygen gas. The principle of 1777 had become a substance by 1897; the metaphor had become an actuality.

Not all chemical concepts have been equally fortunate in leading to true and individual chemical substances; phlogiston, for instance, denoting, as it did, no reality, is phlogiston the concept still. The principle of heat, phlogiston, was supposed to leave a body when it was burned: the theory of Stahl asserted that heat was a thing, a thing which could depart from a body and leave it lighter than previously when it was cold. Now this, as a conception, is quite satisfactory, but as it is not true in fact, phlogiston never materialized; it was never isolated from matter because it never existed in matter. Phlogiston was as barren as "oxygine" was pregnant. To-day, Priestley and Lavoisier could be presented with kilogrammes of the "oxygine" principle, but not a milligram of phlogiston could be extracted for Stahl, because oxygen is a substance, but heat is a mode of motion.

Chemistry furnishes us with another example of the thing in the mind becoming a thing in the outer world of matter, namely, in the history of the conception of the molecule. The atom as Dalton conceived it (1804) was the smallest portion of matter which could enter into chemical union with some other similar substance or could replace some other atom in a compound, thus forming a new compound. In course of time the Italian chemist, Count Amedeo Avodagro (1776-1856), became convinced that there must be bodies composed of two, three, or more atoms—compound atoms in fact—which could exist in a state of freedom, in gases for instance. Avodagro therefore coined (1811) the word "molecule" (the diminutive of moles a mass) "as a term of convenience" to express the conception he had of the smallest portion of matter able to exist in a free state.

Dalton's atom is the unit of chemical activity, Avodagro's molecule is the unit of physical structure. For many a day after Avodagro's time, the atom and the molecule were still "terms of convenience"; neither had been seen; but to-day both atoms and molecules are believed in as real existences; and as for molecules they have been weighed and measured.

The author of a recent text-book of chemistry writes thus: "The Brownian movement has revealed to us bodies intermediate between ordinary particles and single molecules, and has enabled us to estimate the actual weight of molecules" . . . . "There is thus no question that molecules and atoms are real." Not only so, but the physical chemist can calculate the number of molecules in a given volume of gas. It has been computed that there are $72 \times 10_{22}$ molecules in 22·4 litres of a gas at standard temperature and pressure. Thus the thing which began its existence in the world of the mind has become a thing in the outer world of matter; the conception has been discovered to correspond to a real, external physical entity.

Probably the most fruitful metaphor ever used in science was Harvey's as regards the movement of the blood—"motion as it were in a circle." This phrase was of course written in Latin as, "*an motionem quandam quasi in circulo haberet*"; it forms part of the sentence thus translated:

"I began to think whether there might not be motion (or a movement), as it were, in a circle. Now this I afterwards found to be true."

Later in the same chapter (VIII of the "De Motu") he writes:

"This motion we may be allowed to call circular (*Quem motum circularem eo pacto nominare licet*).

The establishing of the reality of the circulation of the blood was absolutely essential to the creation of physiology; modern physiology has, indeed, arisen from this one fact, and the fact received its name—circulation—from the well-known phrase, "circular motion". The metaphorical phrases "circle" and "circular" of 1628 became in due time part of the language of physiology; and the circulation of the blood, which was a phrase and an inference in 1628, became a visible demonstration in 1660. For it is a fact, one of the most pathetic in the history of biology, that Harvey died without ever having seen the blood moving as he knew so well it did, for he passed away in 1657, three years before Marcellus Malpighius—the man born in the year of the "De Motu", 1628—saw the blood in the living capillaries of the transparent lung of the frog. Thirty-two years separated the metaphor from the demonstration, the prophecy from the fulfilment. Had Harvey lived three years longer, he could have seen with his own eyes that what he had prophesied was correct, he could have been shown as an actuality what his reason had discovered as a magnificent inference, the most magnificent inference ever made in the realm of the knowledge of the living.

The next example we may take from physiological chemistry and from that new department of it called "internal secretion". Until comparatively recently, the function of the two small yellow bodies situated near or on the kidneys—adrenals or suprarenals—was entirely unknown and barely even speculated upon. In 1855, Dr. Thomas Addison (1793-1860), of Guy's Hospital, London, described a disease, since named after him, in which the patient suffered from extreme weakness both of body muscles and of the heart, and after death was found to have had his suprarenal bodies degenerated usually through a tubercular lesion. Physiologists very properly assumed that the explanation of this was that in health the suprarenal bodies produced something which, gaining access to the blood, was carried to all parts of the body and maintained the efficiency or tone of the body-muscles as well as the heart and blood-vessels. This something was apparently absent from the blood in Addison's disease. This something remained undiscovered until 1895, when a watery extract of the suprarenal having been made and injected into the veins of a living animal, the result was such an increase in the tonicity of the animal's heart and arterioles that its blood-pressure rose to an astonishing height. Something contained in the suprarenal extract had evidently powerful physiological effects: let it be called "adrenalin". But it is one thing to name a hypothetical substance and another to isolate a real one. In this case, however, the hypothetical substance was a real one, so that after some years of work, between 1897 and 1904, the physiological chemists succeeded in separating from the glands a substance in a state of purity which had all the properties possessed by an extract of the suprarenals. Adrenalin was isolated for the first time about forty-five years after its existence had been surmised. So perfectly had the chemical something, the secretion that maintains the tone of heart and blood-vessels been isolated, that its chemical constitution was satisfactorily studied and the final triumph of making adrenalin synthetically not long delayed. In 1904 it was made synthetically in Germany, and in the following year in England, so that within fifty years of its suspected existence, adrenalin, with all the properties of the natural material, was seen and handled as a pure, crystalline, chemical substance of definite composition. Its structural formula has for some time been familiar to physiological chemists. Here we have literally the materialization of a chemical idea, the crystallization of a notion; the thing of the mind has become a thing of the laboratory, the thought has been captured and bottled.

The next "as it were" we shall take from the history of the physiology of the central nervous system as it is found in the writings of a pupil of Harvey, Dr. Thomas Willis (1621-1675). At the present day the name and the process "reflex action" is as well established as is anything in animal behaviour. One of the most certain things in the physiology of the nervous system is that if we stimulate a nerve going into that system, we shall produce outgoing effects, muscular contractions, vascular or glandular changes. If we decapitate a frog, hang up the body and apply a piece of acid paper to one flank, the leg of that side will be brought up to flick it off, and if the acid be very irritating the whole frog will be thrown into convulsions; these muscular movements are reflex actions. Now this very definite physiological conception of a reflex neural action arose in a metaphor, in an "as it were" of Willis penned about 1650. He said:

"We may admit that the impression of an object driving the animal spirits inwards and modifying them in a certain peculiar manner, gives rise to sensation; and that the same animal spirits, in that they rebound from within outwards in a reflected wave, as it were, call forth local movements."

Willis's notion was that of a wave reflected back towards its source; the metaphor about nerve-impulses being reflected evidently represented the truth, for the conception has lived on and become an integral part of the terminology of neural activity. If there had been no germ of accurate description in it, the idea contained in the metaphorical phrase "as it were reflected", would not have survived to our own day; but it has lived to become the definite description of a fundamental neural truth.

Dr. Marshall Hall (1790-1857), who did so much for the physiology of this sort of action, adopted the phrase and incorporated it in one of his own, the "reflex nerve-arc" which denotes the anatomical path over which reflected nerve-impulses travel. If Willis could visit our laboratories to-day, we could show him reflex actions performed with automatic precision, and below the microscope we could let him see the various links in a reflex nerve-arc. He would find his "as it were reflected" no longer taken in a metaphorical sense, but used as the appropriate mode of denoting one of the commonest and most important of neural activities.

The study of nerve-impulses gives us another example of the inevitable tendency towards concreteness and definiteness in notions reparding the behaviour of the central nervous system. If we go sufficiently far back we find the Greeks, for instance, imagining that the nerve fibres conveyed spirits through their pores (poroi). No doubt these spirits of antiquity are the synonym of our nerve-impulses, something propagated with considerable rapidity from one end of a nerve to the other. Nevertheless, for ages that something was quite inaccessible to human sensation. Some physiologists imagined that muscles became active because the spirits of the nerves rushed into them, but Borelli (1608-1679), in 1670, on cutting open living muscles under water could see no bubbling of gas or anything else suggesting them to be inflated with any kind of substance—spirit, flatus, succus nerveus or gas. But it is to his credit that Borelli looked for something of the kind; he desired to render the succus nerveus concrete, to see, if possible, the action of the spirits in the nerves. It was not to be, for nerve-impulses are a mode of motion and only to be discovered through their effects. In our own day, one evidence of their passage along nerves, namely, the electrical, has been made perfectly obvious by that exquisite instrument, the galvanometer. By the aid of this very delicate apparatus, the electric currents produced by the nerve-impulses can be made to swing a mirror reflecting a beam of light on to a screen, it may be, several yards away. Although nerve-impulses are no more visible to-day than were the nerve spirits of the Greeks or was the succus nerveus of Borelli, we are in a position to show to these thinkers of the past a spot of light jerked two or three feet to the right or left of its resting position through the instrumentality of an electric current generated by a single nerve-impulse whose electromotive force is not greater than 0·015 of a volt. We have not rendered nerve-impulses evident to sight, but we have measured the electromotive force of their electrical manifestations as accurately as we measure the rise of temperature caused by the transference of minute quantities of heat.

We need not be surprised to be told that until comparatively lately it was universally believed that nerve-impulses travelled with incalculable speed, that a flash of thought and a flash of lightning were both prodigiously rapid. In 1850, Professor Helmholtz measured the velocity of the nerve-impulse, and ascertained it to be about one hundred metres a second in the nerves of man. Thus the movements of the spirits, once thought so erratic, have been measured; the intangible is still intangible, but the immaterial has been found to be in material and, as such, to be as real as the material, neither more nor less so.

Of late years there has been a very distinct tendency towards concreteness in regard to ideas of nerve-force and its diminution in fatigue and in disease. At one time nerve-force seemed to be the special property of the quack and the charlatan, but the microscope, which has solved so many problems for us, has shed its light also on this most elusive problem. A substance has been discovered in the interior of nerve-cells which is found to accumulate as the cell rests and to be worn away the longer the cell has been active, a substance which takes the form of minute granules or prisms called after their discoverer, the granules of Nissl. The nerve-cells innervating the wing muscles of a sparrow have been examined in the early morning before the bird has begun to fly about, and similar cells have been scrutinized in a similar bird after a long day of activity; on comparing these two sets of cells under the microscope, the thing wherein they were found to differ was the quantity and appearance of the granules of Nissl. Since these granules tend to disappear when nerve-cells are active, and to reconstitute themselves when nerve-cells rest, they are evidently to be regarded as the physical basis of nerve energy, the local seat of the processes concerned in the output and in the restoration of nerve-energy.

It is clear, then, that the granules of Nissl are concerned with the evolution of nerve-energy and may be called the dynamogenic material or kinetoplasm which is widely distributed throughout the nervous system. But it follows from this that fatigue, in so far as it has a microscopical basis, will be denoted by the more or less complete disintegration of the granules. Fatigue which as understood by most people is merely a particular kind of feeling or sensation, has been shown to produce a cognizable change in some physical structure; in other words, it has been made concrete. General fatigue on its objective side has now been proved to be a condition of bodily poisoning. The prolonged activity of muscles and other tissues results in the output of certain chemical materials notably lactic acid, which, circulating in the blood, produce a mild poisoning, one of the effects of which is to depress the activity of the cells of the central nervous system, the objective sign of which is the partial solution of the granules of Nissl. Thus such comparatively indefinite and elusive things as nerve-force and fatigue have by the microscopists and chemists of our time been identified, and shown to have a local habitation and a general distribution respectively in the minute recesses of the living material of the body. The whole tendency here has been towards the objectifying of the subjective, towards the visibility of the unseen.

Even in the sphere of psycho-physics concreteness of knowledge has taken the place of a time-honoured vagueness. Within the last few years, thanks largely to the labours of Professor Carmon, of Harvard University, we have obtained surprisingly definite knowledge on the subject of the physiology of the expression of the emotions or such at least of these of which anger and fear are trifles.

It seems that the first effect of the uprising of a violent emotion is the stimulation through their sympathetic innervation of the super-renal capsules. These glands in consequence at once put out an increased amount of their specific hormone, adrenalin, which carried to the liver impels it to liberate dextrose from its stored glycogen.

The sugar is transported to the muscles where it is at once oxidized as the energy-yielding material for muscular work; at the same time the heart is stimulated to greater effort so that the blood-pressure rises, especially as the peripheral arterioles are simultaneously diminished in calibre. The muscles of the bronchial tubes are dilated, while the muscles of respiration are excited to increased activity. In this way air is permitted readier access to the depths of the lungs, and preparation is made to eliminate the increased quantity of carbon dioxide which, owing to the increased tone of the skeletal muscles, is rapidly accumulative in the blood.

It is very clear that all these physiological activities are destined to prepare the muscles for flight if the emotion is one of terror, for fight if the emotion is one of rage.

Cannon proved by actual experiment that all these physiological phenomena were produced in a cat which had been enraged at the furious presence of a barking dog. We have now for the first time a rational explanation of why the injection of large doses of adrenalin accelerates the heart and the breathing, constricts the body arterioles, raises the blood-pressure, increases the tone of skeletal muscles, decreases that of bronchial muscles, and finally produces an excess of sugar in the blood which is responsible for the sugar in the urine.

One more aspect of the physiology of emotion has been removed from the realm of the vague to that of the concrete. I refer to the bodily seat of emotion. We all know that the various emotions are expressed by the activity of various systems and organs; grief, for instance, being expressed by tears from the lachrymal glands, shame by dilated arterioles, fear by the blanching of the cheeks, rage by the increased tone of the skeletal muscles and so on.

There is indeed quite a definite mechanism called into play to correspond to the mental commotion related to the increased central activity which most physiologists hold is the essential physical basis of feeling. But certain psychologists have perversely insisted that the particular state of the peripheral organ determines the emotion and vice versa; that, in fact, we feel shame because our blood-vessels dilate, grief because our tear glands secrete, fear because our muscles tremble and so on. These heterodox writers speak of emotion as a reverberation from the periphery into the brain, not as a rushing out of impulses from the brain to the periphery. What most of us believe, namely, that the cerebral cortex is the locus of the emotions was proved by an experiment performed on a dog by Professor Sherrington. The dog had had its central nervous axis cut across just above the medulla oblongata, so that it was a medullo spinal or decrebrate animal. This operation prevents the ascent into the brain of any impulses arising at the periphery below the head. Its viscera could send no impulses into the brain. Nevertheless the dog evinced all the emotions characteristic of such an animal; as its bodily tissues and all its viscera were entirely prevented from sending impulses into their origin at the periphery.

James' theory cannot be upheld; it is a putting the (physiological) cart before the (psychological) horse. Emotion has its seat definitely ascertained to be in the cerebral cortex and not vaguely distributed through the body generally.

Another example of the tendency in science to move from the vague to the concrete may be taken from the outcome of the work of Mendel. Put shortly, he discovered (a) that a property visible in the first generation could be inherited or reappear in the third generation, although no trace of it was visible in the second, and (b) that a given property could appear distributed amongst a certain number of descendants according to a very simple arithmetical ratio, one in three. Mendel (1865) worked exclusively with plants; but his work has been extended to animals where the same "laws" have been found to prevail. Such properties in plants as tallness or shortness, smoothness or roughness in seed-covering, and in animals, roughness or smoothness of hair, length of hair, colour of iris of eye, character of the comb or the wattles of fowls are all inherited in this definite or Mendelian fashion. Properties, then, such as tallness, roughness, colour, etc., can be thought of and experimentally dealt with as entities, as concrete existences. It was a legitimate advance on Mendel's work to speak of the hidden "factor for" tallness or roughness, etc. But the whole concept of character or property became more definite still; there were physical, microscopic structures (chromosomes) in the germ cells which underlay the possession and transmission of properties. Thus Mendelians speak of the factor "for" this or that property because they have reason to believe that just as life as a whole has its physical basis in protoplasm, so certain properties have their physical bases in microscopic portions of protoplasm (chromosomes) in the male cells and in the female cells of both plants and animals.

No better example than that of the ferments could be given of a notion becoming in course of time a substance isolated and tangible. Fermentation, the totality of changes produced in digestible, coagulable or putrescible material, was for ages believed to be inscrutably mysterious. It was made the subject of debate between the iatro-mathematicians and the iatro-chemists of the seventeenth century, but neither school really understood it.

Digestion, the great fermentative process in animals, was confused not only with putrefaction, but with boiling and with the effervesence of gas in chemical operations. Stahl (1660-1734) saw in digestion the direct activity of the soul or anima which, he held, permeated every tissue and endowed it with its special powers. The chemistry of it all, however, was unknown; the very conception of a ferment—a substance produced by living matter but not itself living—had not as yet emerged from the mental confusion.

Van Helmont (1577-1644), Sylvius (1614-1672), de Graaf (1641-1672), Haller (1708-1777), all groped for it, but it was not until through the work of Réne Antoine Ferchault de Réaumur, about 1750, that any true notion was held as to the nature of fermentation in digestion. Réaumur was the first to obtain gastric juice in an approximately pure state and to attempt digestion with it outside the body. Spallanzani, the distinguished Italian naturalist at Pavia, began where Réaumur left off, and soon discovered (1777) that digestion was by no means putrefactive but was apparently due to some "solvent power" or "active principle of solution" in the gastric juice. Then by degrees as physiological chemistry improved its methods, it got finer results, and at last "the solvent power" or "principle of solution" in the gastric juice was isolated in 1862 as the white powder, pepsin, a name which had been given to the active principle by Schwann as far back as 1836. Soon other ferments were either isolated or obtained in solution, and to-day in our laboratories we store in glass bottles half a dozen or more of those actual substances which are the modern representatives of the "principles of solution" of the early researchers. The vague has become definite, the conceptual power or property has become the material substance or entity.

Of course it is very largely in the sphere of the healing art that this modern tendency towards concreteness is seen in its highest perfection.

Let us take the case of Malaria or Ague, a disease the cause of which not so very long ago was absolutely unknown. Not that it was not attributed to causes such as "paludism", "telluric influences," "exhalations," "vapours," and so on, but these did did not explain anything. The word malaria is derived from two Italian words meaning "bad air", clearly showing that the atmosphere was held to be responsible for some peculiar kind of corruption or infection as we should now call it. Paludism, the influence of marshes, could not be seen; what could be seen were fogs or vapours rising from the marshy ground, and these were blamed for spreading malaria, and people were told to beware of the damp and of night air. But why vapour, whether in the daytime or at night, should breed any kind of disease, most of all so definite a disease as ague, was not at all obvious. At last all these vaguenesses were dispelled, and malaria was discovered (1880) to belong to that already large group of diseases known as parasitic, the parasite in this case being of animal and not vegetable nature. Malaria was found to be due to the destruction of the red blood-corpuscles by their having been made the residence of a minute animal parasite, the Plasmodium Malariæ, which had been inoculated into the patient through his having been bitten by a certain kind of gnat or mosquito (Anopheles) which had sucked blood from some one suffering from malaria. It was not contagion, nor ordinary infection, far less bad air, vapours or exhalations, it was natural, accidental inoculation with foreign blood containing excessively minute living creatures classed by zoologists as a species of Protozoa.

Thus the connexion of malaria with marshes and vapours and night-time was at once explained by the facts that the mosquito lays its eggs in damp places and frequents damp places towards evening and after dark. The meaning of the usefulness of quinine is explained by its being able to kill the parasite in the blood; it is simply a not too poisonous, local, circulating germicide. Thus the microscopist has tracked down one of mankind's subtlest foes, found it neither mist nor marsh, vapour nor corruption, but a moving, living creature, a member of the lowest group of such known. The vagueness has gone; the cause of malaria can be viewed sealed up in Canada balsam under a cover-glass.

Another excellent example of the rendering definite what was before of the vaguest is the recent discovery of the cause of plague, the pestilence, or Black Death. In the fourteenth century the great surgeon of Avignon, Guy de Chauliac (1300-1370), attributed the plague to a conjunction of the planets Saturn, Jupiter, and Mars in the sign of Aquarius on March 24th, 1345. About the same time the Jews in Germany and Switzerland were suspected of poisoning the wells and were in consequence persecuted and massacred. In the fourteenth century the medical faculty of the University of Paris was asked to deliver an opinion on the nature and origin of plague, but a very great deal that it promulgated was absolutely fatuous as regards protection or cure. One thing only was recommended that is interesting in the light of to-day, namely, the fumigation of houses by the burning of aromatic herbs and woods. Only as recently as 1894 was the *vera causa* of the Black Death, one of mankind's most terrible afflictions, discovered by two Japanese doctors, Yersin and Kitasato, and named the *Bacillus pestis*. It was soon isolated in pure cultures, grown in artificial media, and its toxins and antitoxins became chemical entities.

The history of the discovery of what plague is really due to is a strange, eventful history. The Black Death, that most dreadful scourge of mysterious origin, was for centuries attributed to such sources as the conjunction of planets, the iniquities of the Jews, or to some special outpouring of divine wrath on account of human sin. Mankind, utterly at a loss to discover its true relationships, had for millennia imagined vain things, and essayed the most grotesque methods of averting it. But in the fullness of time the microscope was devised, and with it the dawn of the day of exact knowledge had arrived.

The source of the plague was shown to be a bacillus, a most minute, vegetable parasite, which growing in bodies of certain animals, rats and other rodents, could give rise to a virulent poison (pestiferin) which was carried to all parts by the circulating blood. It was further shown that man became inoculated by fleas which had been feeding on the bacilli-containing blood of rats. Thus were revealed the several links in that long chain which had the *Bacillus pestis* at one end and man at the other. It took mankind three thousand years to come to a knowledge of the truth regarding the cause and manner of the spreading of plague, to a knowledge of that chain of cause and effect which connects microbe and man in the dire relationship of the plague-stricken.

Science, then, has come face to face with the spectre of the Black Death and recognized its features. She has laid hold of "the pestilence that walketh in darkness" and made it reveal its horrid origin.

Similarly, for Influenza, a disease in its epidemic form, if not quite as deadly as plague, then quite as mysterious; in some forms quite as deadly. Very probably some of the great epidemics of the Middle Ages were in reality what we now call influenza, its very name being only the Italian for influence, a something inscrutable but omnipresent, mysterious in the last degree. The usual expressions were in vogue, it was a corruption in the air, a miasma, an exhalation and so on; until in 1892 the bacteriologist Pfeiffer isolated the organism of influenza and named it the *Bacillus Influenzæ.* Not the air, then, but the microscopic fungi it may hold for evil influence, is the true cause of influenza. The influence is now materialized, nay indeed is isolated and sealed down under glass for the inspection of trained eyes. Thus by the microscope are these deadly powers of the air one by one distinguished from each other and identified each by its particular malignancy.

The story of the discovery of the telescope, how it was bound up with that wonderful emancipation of the human spirit from the thraldom of mediæval ignorance and the hatred of scientific light, has been told us by many learned men; but I venture to think that the discovery of the microscope, which has never yet had its historian or its poet, was one fraught with many more beneficent results for humanity. By its scrutiny the invisible but actual sources of most of the scourges of mankind have been discovered; and it would seem that it is in its power and not in that of fleets or armies that we must look for the physical salvation of the sons of men. Man may redeem himself from death, not by sweeping the heavens with the space-annihilating telescope, but by peering into the dust of the earth with the space-creating microscope.

We see then that the principle of the incarnation of ideas, of the realization in the world of substance of what had been vaguely foreshadowed in the world of mind, is a process which has gone on in science as surely if not perhaps so conspicuously as it has in art. The artist succeeds more or less perfectly in incarnating his ideas of beauty in stone, wood, metal, or pigment; but no painter ever yet expressed all the loveliness in his mind, pellucid though his pigments were; the poet strives to give utterance to the majesty of his imagination, but no poet was ever yet satisfied that his words, choice though they were, portrayed all the delicacy of his fancy or the glory of his dreams. The musician is conscious that after he has swept the lyre with melodies of transcendant sweetness, there are unheard melodies that are sweeter still; the preacher, whose eloquence stirs the vast cathedral, returns home depressed with the thought that his burning words did not rise to the fever-height of his fervour. The saint, aiming at the highest ideals of holiness, has still to confess failure whether as anchorite, prophet, missioner, or philanthropist.

But it is sometimes given to the man of science to touch, to taste, to handle what was once only a notion, a suggestion, a forecast either in his own day or in that of a less fortunate predecessor in the earlier times of the history of a thought.

DR. WILLIAM D. BRYDONE JACK, of Vancouver, has been appointed superintending engineer of the public works department for the provinces of Manitoba, Alberta and Saskatchewan. Dr. Brydone Jack is a native of Fredericton, New Brunswick.

SANITARY RECORDS OF HOUSES

By J. A. Baudouin, M.D., D.P.H., M.O.H., Lachine

Professor, Laval University, Montreal

MANY very important health problems are being studied by the members of this Congress. Is it not then a reason for the question of house sanitation to be considered very carefully?

Housing Problem

It is useless to speak at great length on the relation which exists between the sanitary conditions of houses and the health of the people living therein.

Professor Leonard Hill in his "Report on ventilation and the effects of open air and wind on the respiratory metabolism", published in 1914, truly says: "Over-heated rooms and still air decrease the activity of the body furnace and so lead to lessened vigour and resistance to disease. Excessive protection from cold weather by over-clothing, over-heating and shutting off of wind lessens immunity and increases the susceptibility to such diseases as pneumonia and phthisis."

The mortality rate is influenced by the condition of the home as is amply proven by statistics collected by Dr. J. B. Russell, late medical health officer of Glasgow, Scotland, which I find in the Ontario Public School Hygiene, by Professor A. P. Knight, of Queen's University, Kingston:

Size of house	Percentage of total number of deaths
One room	27·0
Two	47·0
Three rooms	13·0
Four rooms	4·3
Five rooms and upwards	3·3

And the statement made in Paris in 1905, at the International Congress on Tuberculosis, stands true: "The problem of sanitary housing will always be considered most important in the prophylaxis of tuberculosis."

Quoting "Hygiene and Public Health", by Parkes and Kenwood, we find another proof of the influence of the conditions of houses on the mortality rate from tuberculosis: "The part which over-crowding and foul air play in promoting the prevalence of phthisis is well shown at Salford (Dr. Barry and M. Gordon Smith's inquiries—data supplied by Dr. Tatham). Thus, in districts where all the houses were built on the vicious system known as 'back to back', the phthisis death-rate was 5·2 per 1,000 living; where 56 per cent. of the houses were so built, the rate was 3·6; where 23 per cent. only were so constructed, it was further reduced to 3·3; and, lastly, where there were *no* 'back to back' houses—that is to say where all the houses were provided with some means of light and air in front and to the rear—the rate was only 2·8 per 1,000."

Even the narrowness of the streets bears on the tuberculosis mortality rate as is shown by the following statistics from Paris: In an ordinary street the mortality rate by tuberculosis was found to be 6 per cent.; in narrow streets, it increases to 16·46 per cent.; and in very narrow streets, it reaches 18·84 per cent.

The following conclusions have been further established by M. Paul Juillerat, the director of sanitary records of houses of Paris:

1. The mortality by tuberculosis increases in ratio with the height of buildings.
2. Tuberculosis is met with more often in the lower flats than in the upper storeys of houses.
3. A house showing a high tuberculosis death rate is practically never isolated. The near-by houses are also affected with more or less severity. There are houses and groups of houses which are intense foci. Tuberculosis is to be found there permanently.
4. Mortality by the other contagious diseases does not follow the tuberculosis mortality. There is no correlation between these two causes of death.
5. The cause of the high mortality in the tuberculosis houses is to be found in the house itself, it consists in the want of light and mostly in the want of sun. Tuberculosis is above all the disease of darkness.

Other authorities might have been also cited, but these figures and quotations are sufficient to show that there is a housing problem involved.

The science of hygiene must be able to define the conditions of sanitary housing.

Public health officers must draft by-laws, if need be, or enforce existing by-laws in order to insure to the population decent conditions of housing.

SANITARY HOUSING

What are the conditions of sanitary housing? This important question has been studied by scientists and to-day these conditions are known. They relate in brief in the following: Soil, aspect, lighting, ventilation, warming, plumbing, cleanliness.

I will not give any demonstration on these conditions. They are too well known by the members of this Congress and the modern text-books fully illustrate them.

But the practical question to be considered is this. To what extent are these conditions realized in the dwellings occupied by the numerous labouring classes of our cities and how can the insanitary conditions found be corrected in the existing houses and prevented in new houses?

SANITARY RECORDS OF HOUSES

The only practical way for the municipal health authorities to know the housing conditions of the population is by instituting the sanitary records of houses. Its object is to record exactly and continually the sanitary conditions of all the dwellings in a municipality.

The organization of the sanitary records of houses is not a new thing. Brussels has had such a record since 1871, Moscow also for a long time. Berlin has had a sanitary statistic of its houses since 1874. Hâvre started its own in 1879, then came Saint Etienne in 1883, Amiens in 1884, Nice in 1887, Paris in 1893, Nancy in 1903, Orleans in 1905. Since that date many other cities in Europe have been provided with a similar organization.

The record includes the sanitary description and history of houses. Each dwelling has its record regarding the following points: Street, number, designation (house, store), nationality of inhabitants, number of rooms, number of persons, previous contagious diseases, deaths, appearance (cleanliness, No. 1, good; No. 2, unclean (want of ventilation); No. 3, bad; water closet located in a room provided with a window, ventilated, bath, dark rooms, how many, nuisance in cellar, water in cellar, air-holes in cellar, nuisance in yard, stable, plumbing (siphons to sinks, etc.), soil pipe above roof, wet walls, privies, sketch of the house, date. When needed, this information can be completed by figuring the number of cubic feet of air available in the house, the open space around the house, etc.

In the province of Quebec every municipality is authorized to organize the sanitary records of its houses by Articles 3,896 and 3,931 of the Public Health Act, which contain the following:

Article 3,896. The municipal sanitary authority shall cause the immovables situated within the municipality to be visited from time to time, by its executive officer, or the other officers in its service to ascertain whether there are any nuisances.

Article 3,931. The members, officers and employees of the municipal sanitary authority may enter any immovable to make the inspection which they deem necessary.

When insanitary conditions are found at the inspection of the houses, remedies can be applied to the extent that the law and by-laws permit. Important statistical data can also be obtained.

IMPROVEMENT OF DWELLINGS

The insanitary conditions found are the following: Uncleanliness, water closets located in dark, unventilated rooms; dark rooms; overcrowding; cellars used as dwellings; defective plumbing; humidity; absence of bath; privies; open manure boxes; insufficiency and even absence of open space around the house.

(a) Enforcement of the law. When in a dwelling the coexistence of many insanitary conditions is found to the extent that such dwelling is considered unhealthy, the municipal sanitary authority, by virtue of Article 3,907 of the Public Health Act, may cause the inmates to leave it and forbid their return until the premises have been improved.

(b) Enforcement of the by-laws. Two cases can here be met with.

On one hand the dwellings, without being absolutely unhealthy, are nevertheless not built in conformity with the by-laws in force; or, on the other hand, the by-laws do not apply to certain defective buildings because they have come into force after their erection.

When houses are found not built in conformity with the by-laws already in force the remedy provided is the enforcement of the by-laws and the fine. We must ascertain therefore, the point at fault in the house and the date the articles of the by-laws regarding this particular point were published in the *Official Gazette* of Quebec. Some articles were published on June 13th, 1891, and can be applied to all houses built since that date, and the other articles on October 13th, 1906.

But the difficulty may present itself in many cases to know the exact date a house has been built and to prove it.

As for the houses built prior to the dates aforesaid mentioned, the law affords no help whatever to obtain the improvements found to be necessary at their inspection.

If it is admittedly good to improve the houses already built; is it not even better to prevent the same faults against the by-laws in the houses before they are erected? The correction of these faults necessarily entails expenses, whereas their prevention costs nothing. But it is possible for all municipalities with a population of ten thousand or over, to obtain such a result by the application of Article 39x of our provincial by-laws which provides, as follows:

"It is forbidden to proceed with the construction of buildings, houses and dependencies of any kind, as also the remodelling of existing structures, without submitting the detailed plans and specifications thereof to the municipal sanitary authority and to have obtained the approval of its executive officer. Such approval shall only be given when the plans or specifications show that the carrying out of the provisions of the present by-laws have been provided for."

The execution of the plans can be controlled by a system of inspection made during the course of erection and carried out until the building is finished.

These considerations show the legal means actually at our disposal to improve in some measure the defects in houses and to prevent them. But there is also another very practical method which could be resorted to and in many cases would bring out the best of results without using in any way the rigours of legal procedures. Unhappily, it is yet forbidden to us to make use of it, because so far it has not been provided for in the law which should be completed in this particular point. It consists in having the tenant instructed on the insanitary conditions found in the house he occupies and thus interesting him in asking the landlord to apply the proper remedies, making of it even a condition of the lease. I earnestly hope, for the best protection of the community, that before long our laws will be amended accordingly.

Nevertheless, it is not enough to obtain from the law somewhat extended powers, but these must be applied. And it is for this reason that I have organized in my own city of Lachine, of which I have the honour to be the medical officer of health, the sanitary records of houses with the following result:

Sanitary Records of Houses in Lachine

The work, started during 1914, was completed only at the end of 1915.

All dwellings, stores, offices, etc., within the city, making a total of thirty-one hundred and nineteen, have been thus inspected by the sanitary inspector according to the following formula. The description of the house is completed by a sketch of the same given on the reverse side of the formula. The inspection of the hundred and two dwellings and stores erected in 1916 has completed up-to-date, the records of all our houses.

CITY OF LACHINE

Board of Health

Sanitary Records of Houses

Street.. No..................
Designation { Dwelling...
Designation { Store...
Nationality of occupants...
Number of rooms........................ Number of occupants................
Contagious diseases...
Death.......................... Disinfection.............................
Appearance (cleanliness)*............... Water closet...... Ventilated........
Placed in a room provided with a window................. Bath................
Dark rooms................................ How many..................
Nuisance in cellar........................ Water in cellar.................
Cellar with ventilation...
Nuisance in yard............................. Stable.....................
Plumbing, sinks provided with siphons, etc.................................
Soil pipe above the roof...
Wet walls................................. Privies......................
Date...

* 1, Good; 2, Dirty (want of ventilation); 3, Very dirty.

The result of the inspection showed that the population of Lachine is composed of twenty different nationalities, in the following proportion:

HOUSES AND STORES OCCUPIED BY

French Canadians French	1,396
English Scotch Irish	1,079
Jews	134
Austrians Germans Gallicians	52

Russians Rumanians	47
Italians	46
Polish	29
Indians	19
Syrians	11
Chinese	11
Greeks	9
Swedish	3
Danish	2
Unoccupied	281
Total	3,119

We were further in a position to know the most important insanitary conditions of our houses. They are as follows:

1. Uncleanliness. The great majority of our houses, exactly twenty-five hundred and thirty-one, or 89 per cent., are kept in a proper manner. Two hundred and forty-seven houses (8·9 per cent.) have been found dirty, and sixty (1·6 per cent.) very dirty. The proportion of dirty houses is made up mostly of those occupied by families of foreign nationalities—Austrians, Russians, Polish, etc.

2. Want of window in the rooms wherein are placed the water closets. The inspection of our houses shows that in sixteen hundred and thirty-six houses, or a proportion of 52·4 per cent., the water closets are placed in rooms not provided with a window.

3. Want of ventilation in the rooms wherein are placed the water closets. In one hundred and sixty-five houses (5·2 per cent.) such ventilation is made through the house only, to the great annoyance of the people living therein.

4. Dark rooms. In Lachine we had two hundred and forty dwellings (7·6 per cent.) with this very important insanitary condition, two hundred and twenty-three had one dark room, seventeen had even two.

5. Overcrowding. (a) Our twenty-seven hundred and sixty-one occupied dwellings are divided as follows, according to the number of their rooms:

Dwellings of 1 room	12
Dwellings of 2 rooms	49
Dwellings of 3 rooms	209
Dwellings of 4 rooms	710
Dwellings of 5 rooms	736
Dwellings of 6 rooms and over	1,045
Total	2,761

(b) The number of occupants in each class of dwellings is the following:

Dwellings of	Number of occupants
1 room	33
2 rooms	140
3 rooms	783
4 rooms	3,308
5 rooms	3,780
6 rooms and over	6,146
Total	14,190

(c) The average number of occupants in each class of dwellings is the following:

Dwellings of	Average number of occupants
1 room	2·85
2 rooms	2·85
3 rooms	3·74
4 rooms	4·65
5 rooms	5·13
6 rooms and over	5·88

The average is, therefore, 4·18 persons per dwelling.

(d) The average number of persons per room in each class of dwelling, is the following:

Dwellings of	Average number of persons per room
1 room	2·85
2 rooms	1·42
3 rooms	1·24
4 rooms	1·16
5 rooms	1·02

The average number of persons per room in these five classes of dwellings is, therefore, 1·54.

These figures show that on the average our dwellings give a very favourable result.

To find out the places where overcrowding exists the exact number of persons living in each class of our dwellings must be known. This is shown by the following figures:

(e) The number of persons living in dwellings of one room is the following:

Number of dwellings with 1 person	5
Number of dwellings with 2 persons	2
Number of dwellings with 3 persons	1
Number of dwellings with 4 persons	1
Number of dwellings with 5 persons	1
Number of dwellings with 6 persons	2
Total	12

(f) The number of persons living in dwellings of two rooms is the following:

Number of dwellings with 1 person	7
Number of dwellings with 2 persons	13
Number of dwellings with 3 persons	15
Number of dwellings with 4 persons	9
Number of dwellings with 5 persons	4
Number of dwellings with 6 persons	1
Total	49

(g) The number of persons living in dwellings of three rooms is the following:

Number of dwellings with 1 person	4
Number of dwellings with 2 persons	47
Number of dwellings with 3 persons	56
Number of dwellings with 4 persons	47
Number of dwellings with 5 persons	24
Number of dwellings with 6 persons	20
Number of dwellings with 7 persons	6
Number of dwellings with 8 persons	3
Number of dwellings with 11 persons	1
Number of dwellings with 12 persons	1
Total	209

(h) The number of persons living in dwellings of four rooms is the following:

Number of dwellings with 1 person	9
Number of dwellings with 2 persons	83
Number of dwellings with 3 persons	135
Number of dwellings with 4 persons	146
Number of dwellings with 5 persons	119
Number of dwellings with 6 persons	102
Number of dwellings with 7 persons	53
Number of dwellings with 8 persons	29
Number of dwellings with 9 persons	19
Number of dwellings with 10 persons	6
Number of dwellings with 11 persons	7
Number of dwellings with 12 persons	1
Number of dwellings with 14 persons	1
Total	710

(i) The number of persons living in dwellings of five rooms is the following:

Number of dwellings with 1 person	1
Number of dwellings with 2 persons	82
Number of dwellings with 3 persons	128
Number of dwellings with 4 persons	120
Number of dwellings with 5 persons	129

Number of dwellings with 6 persons	101
Number of dwellings with 7 persons	64
Number of dwellings with 8 persons	44
Number of dwellings with 9 persons	29
Number of dwellings with 10 persons	21
Number of dwellings with 11 persons	6
Number of dwellings with 12 persons	5
Number of dwellings with 13 persons	3
Number of dwellings with 14 persons	2
Number of dwellings with 16 persons	1
Total	736

In Articles 43b and 43c of the provincial by-laws a minimum of three hundred cubic feet of air is required for each person, which is far from being excessive. We can, therefore, draw the conclusion that all the dwellings in which the number of occupants is such that there is not to be found for each one of them the minimum asked for by the by-laws may be considered as overcrowded. We have found overcrowding to a greater or less extent in one hundred and six houses.

6. Plumbing. In forty-six dwellings we have found plumbing to be grossly defective, and in twenty-six others we have found that there was even no soil pipe.

7. Dampness. We have found water in the cellar of eight dwellings, thirty-seven unventilated cellars and twice damp walls.

8. Bath. In the majority of our houses there is no bath.

9 Privies. We have found fifty-nine privies.

10. Open air space around houses. Most happily, with the exception of but a few houses, our dwellings are fronted by a street of proper width and have in rear a yard large enough. Our "back-to-back" houses are very few indeed.

From the sanitary records of houses we learn further the distribution of contagious diseases, because the record of each dwelling shows all the contagious diseases outcoming therein. Thus we see that since June 2nd, 1913, up to March 18th, 1917, we have registered a total of eight hundred and forty-nine cases of contagious diseases, forty-four of which being tuberculosis, distributed in six hundred and forty one dwellings, as follows:

1 case of contagious disease in	519 dwellings
2 cases of contagious diseases in	93 dwellings
3 cases of contagious diseases in	21 dwellings
4 cases of contagious diseases in	4 dwellings
5 cases of contagious diseases in	3 dwellings
6 cases of contagious diseases in	1 dwelling

19·83 per cent. of our dwellings have been visited by contagious diseases during this period, covering nearly four years, and during the same period a proportion of 1·36 per cent. have received tuberculous people.

But the finding out of the insanitary conditions of our dwellings is only the first part of the work. This must be followed naturally, by the classifying of all our houses according to the insanitary conditions found in order to undertake their systematic improvement. Thus we have made a division of dwellings with privies, with manure boxes, with dark rooms, with defective plumbing, etc. With all the indispensable information in hand we have started, in 1916, the necessarily long work of having all the insanitary conditions removed one after the other, or as much as circumstances permit.

1. Privies. The first war was undertaken against the privies to have this nuisance removed according to the authorization given by the health by-laws. Out of fifty-nine privies found, twenty-six were located on streets not yet provided with sewers and accordingly did not come under the by-laws. But there was a balance of thirty-three against which it was in our power to act. Notices have been addressed to all interested with the result that thirty privies have been removed. The three ones remaining are tolerated until we have heard from the landlords responsible.

2. Manure boxes. To keep up the cleaning-up campaign inaugurated in spring 1914, we have put into effect Article 53 of our by-laws which states that manure boxes must be closed. Due notices have been addressed to the two hundred and thirty-eight citizens who were keeping manure boxes within the limits of the city, repeated inspections have also been made by the sanitary inspector and to-day we are pleased to see that practically all manure boxes are made and kept in conformity with the by-laws; therefore, in all those places which are known as the favourite breeding places for flies, these insects will be prevented from multiplying so rapidly and acting as a cause of contamination of food.

3. Overcrowding. The figures given regarding the overcrowding of our houses apply to 1915 only; the same result would not have been found in 1916, on account of the unusual present circumstances for thousands of men are now working in large shops. These exceptional conditions of work have been the cause of a great increase in our population whereas, during the

year, only one hundred and two new houses have been built. Therefore, there was a notable increase in the number of persons per each dwelling, many families using only a limited space to receive boarders in one or two rooms. But it has seemed to us better not to interfere in such cases because we have considered this state as only temporary and limited to the length of war.

4. Dark rooms. We have started a vigorous campaign to obtain their improvement as much as circumstances permit in each case.

Upon the first visit of the inspector, when the sanitary records of the houses were made up to the end of December, 1915, we found two hundred and fifty-seven dark rooms.

During the summer of 1916 a second inspection of these houses was made to complete the information already obtained by the drawing of a sketch showing the location of the dark room and the best means to be adopted to admit therein directly the light from outside. At this second inspection two hundred and thirty-one dark rooms were found. This result shows that through the explanations given by the inspector at his first visit proving that these rooms were not favourable to the health of the people living therein twenty-six landlords had understood that it was in their interest to correct this insanitary condition in so many houses.

Encouraged by this first success, new illustrations were given to those interested in the improvement of these two hundred and thirty-one dark rooms, with the result that at the end of the year 1916 the number of dark rooms had been reduced to one hundred and sixty-four. Through these peaceful ways we have obtained the correction of ninety-three dark rooms in only one year. This is a proof that in many cases the landlords have the best of intentions and when correctly informed are willing even to incur expenses in the interest of the health of their tenants.

Following these encouraging results a new effort has been tried to improve the balance of one hundred and sixty-four dark rooms. To that effect, during the month of December the following letter has been addressed to all the interested landlords:

> Sir:
>
> The sanitary state of dwellings bear considerably on the health of the families living therein. And one of the most important qualities of a sanitary house consists in giving a wide access to light and mostly to sun light. Because it is proved by science that germs of contagious diseases, and mostly the germ of tuberculosis, can live

> very long in darkness, whereas they die quickly when they are exposed to the light and are even killed in a few minutes by the rays of the sun.
>
> The municipal health authority, the object of which is to protect the health of the citizens, has therefore the duty to start a campaign against the deadly dark room, the true nidus of tuberculosis. And it is for this reason that it has received the following authorization from the Superior Board of Health of the province.
>
> Article 43 h. bis. The municipal sanitary authority may set on the wall of any room which has no window a notice reading as follows: This room having no window, opening directly outside the building, cannot be used for either day or night occupation.
>
> An inspection of the house bearing No....street.... .... owned by you, has shown in such house the existence of a room having no window opening directly outside the building.
>
> Consequently in conformity with the law and with the purpose of protecting the health of the families living in your house, we will be in the obligation of setting the said notice if the proper repairs are not made within the delay of eight days.

The notice was set accordingly with the result that so far thirty-one more dark rooms have been removed leaving a balance of one hundred and thirty-three more. It is our intention to keep up this campaign until all the dark rooms which can be remedied are effectively improved.

5. The other insanitary conditions of houses shown in their records will now be dealt with and we will make due efforts to have them corrected. To that effect a new complete plumbing by-law has been prepared which will be a great help in improving a great number of our houses in which the plumbing is far from being perfect.

In order that the same insanitary conditions may be prevented in new houses, they are kept under control during the whole time they are being erected. To this effect the sanitary inspector has made three hundred and eighty-two inspections during last year and we are pleased to state that the one hundred and two new dwellings and stores erected in 1916 are all built in conformity with our by-laws.

As a conclusion, may I be permitted to submit the following resolution:

1. That at least all the important cities in the Dominion be invited to organize the sanitary records of their houses.
2. That the law in the province of Quebec be amended to the effect that the executive officers of the municipal boards of health be authorized to communicate to the tenants the insanitary condition of the house they occupy.
3. That the present resolution be addressed to the parties interested.

THE old agricultural buildings at Winnipeg have been enlarged and converted into what is now the Manitoba Military Convalescent Home, which has accommodation for seven hundred soldiers. As in other convalescent homes under the direction of the Military Hospitals Commission, classes are held in vocational training of all kinds and ample provision has been made for recreation. A library and reading room have been provided by members of the Grain Exchange in memory of Cadet George Morton.

THE CARE AND TREATMENT OF MENTAL DEFECTIVES

BY HELEN MACMURCHY, M.D.

Toronto

HOW many mentally defective persons are there in Canada? The best way to answer this question, at present, is to ask another. How many insane persons are there in Canada?

In the province of Ontario, for example, with a population of about two and a half millions, we have at present about seventy-five hundred inmates in our provincial hospitals for the insane; or about three per thousand of the population.

It has been found in Great Britain, in the United States, and wherever else this matter has been investigated, that the number of mentally defective persons in the community closely approximates the number of the insane; and in Canada so far, all the facts we have ascertained seem to make it probable that this may be said to hold good here. Moreover, the number of mentally defective children found in our elementary schools is also, apparently, comparable with the number found in the English elementary schools, about 2 per cent.

Why has little or nothing been done for the care of mental defectives?

Because "knowledge comes, but wisdom lingers".

About a hundred years ago, soon after 1801, Itard and Seguin, and others, drew attention to the necessity of caring for the lowest grade of mental defectives, those who were then spoken of as "idiots", but whom we now think and speak of as "persons having a mental age of about two years".

Before the nineteenth century ended, two new discoveries were made in regard to mental defectives.

1. It was gradually found out that there was a higher grade of mental defectives, those who were at first called "imbeciles", but whom we now think and speak of as mentally defective persons having a mental age of about three to seven years.

2. Then it became known, about 1880, that there were persons

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who were certainly mentally-defective, but of a still higher grade, those whose mental age was from seven to twelve years, or even higher.

Now comes the point! Our practical action, our "wisdom" in dealing with mental defectives is about one hundred years behind our knowledge. We still are dealing with the problem of mental defectives as if we had only the low grade cases to deal with, though we all know that the care of low grade mental defectives is the smallest and easiest part of our problem. Consider for a moment the relative numbers alone of the three grades.

Tredgold, in his book on "Amentia", gives the percentage figures thus: Low grade, six; middle grade, eighteen; high grade, seventy-six. This is confirmed by all other authorities on the subject. "Knowledge comes, but wisdom lingers!"

How should mental defectives be cared for, and treated?

In principle—

A good deal like normal people. They need first, a suitable environment.

Persons of subnormal mentality cannot fit into a world intended for normal people. We must make an environment for them; that is, an institution.

Perpetual children must have perpetual care.

They need, second—

To develop their gifts and capabilities.

All mental defectives have gifts and capabilities, (of course, there are exceptions to all general rules) and the use of these powers and gifts has secured the success of the work at the many farm colonies, on the cottage plan, in the British Empire, the United States and other countries, where thousands of mental defectives are now cared for.

Why should we do anything about mental defectives?

1. Because this is a form of national service.

2. We are the ones who know most about this question.

If we do not do anything to help about mental defectives, who will?

We owe it to the country that gave us our medical education, to help Canada in national medical problems, and this is one.

3. Because mental defectives drag down the standard of public health.

If they were properly cared for, public health would be greatly improved. Consider the rôle of the mental defective in transmitting tuberculosis, syphilis, and other transmissible diseases.

4. Because if mental defectives were properly cared for, it would—

Reduce the number of illegitimate births.

Reduce, by 50 per cent., the number of women arrested for prostitution.

Reduce, by from 10 to 20 per cent., the number of criminals.

Reduce, by 80 per cent., the number of unemployables.

Reduce, by 30 to 50 per cent., or more, the number of inmates in charitable institutions.

5. Because if mental defectives were properly cared for, they would leave no children behind them to carry on this problem in a worse form to the next generation. As the *British Medical Journal* said, in discussing this question: "Our duty to our neighbour must now be held to include our duty to posterity."

The right to life and happiness is one thing; but the right to parenthood is another.

What shall we do about mental defectives?

1. Give proper instruction on this subject to all medical students.

2. Help to educate the general public, especially judges, lawyers, clergymen, teachers, and other leaders of public opinion about this question.

3. Promote and improve medical inspection of schools by every means in our power, so that mental defectives may be recognized.

4. Support and encourage the movement for special or auxiliary classes for all children needing special training or education, so that they may be taught what they *can* learn, and not what they *cannot* learn. Four Provinces have these classes now.

5. Aid and assist in the formation of voluntary associations for the care of the mentally defective. Nova Scotia and Ontario have already formed such associations.

6. Direct and encourage the movement to establish (on a small scale at first, but with ample land provided for) farm colonies on the cottage plan.

7. Assist in securing the necessary legislation, by Royal Commission, or other means.

8. Assist in securing the proper medical examination of all immigrants.

9. Give every assistance in our power to the movement in favour of a Dominion Minister of Public Health.

HYSTERIA IN THE MALE

By Campbell Meyers, M.D.

Toronto

A. B.—admitted to my private hospital January 23rd, 1917; occupation, bank clerk; age, twenty-three; born in Canada; father, Scotch; mother, Canadian.

Family history. Mother of decidedly nervous temperament. Her general health is fairly good, although she suffers at times from rheumatism. Present age about fifty-five. Father's health excellent. Two brothers (one at the front), both healthy. No sisters. The paternal grandfather, who was inclined to alcoholism was a weaver by trade. He was devoted to literature, chiefly philosophical, which he developed as a hobby, and his whole life became gradually absorbed in this occupation. His literary attainments were a source of great pride to his family. Patient's father and brothers all very temperate. The maternal grandfather said to have become senile at seventy.

Previous history. As a child he was afraid of the dark, and had violent fits of temper without sufficient cause. He began school (kindergarten) at three years of age and remained until five when he went to public school and passed entrance examination at eleven. The progress in his education which had been uncommonly rapid until this age, began to diminish quickly owing to a change in school so that he was obliged to spend two years in the first form of the high school. This he attributes to a difficulty in following the more advanced subjects which he could only grasp with much effort. During the third year progress was very slow. His eyesight at this time was defective but he felt he could not grasp the subjects as well as previously, although certain subjects he learned with uncommon ease. He left school in his sixteenth year as he was making no progress. He had been suspended for a month at a time for bad behaviour. During his twelfth year he learned to smoke cigarettes, and often played truant, etc. His school days after eleven years of age were filled with mischief of various kinds, and he frankly admits he deserved all he received

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in way of punishment. He says that before eleven his progress at school was remarkable and he was much flattered by the praise of his teachers. After this age and in a different school, as he began to lag in his studies, he did not get on with his teachers and consequently his vanity suffered. He has been a very heavy smoker, usually of pipes and cigars during the past year and a half. No alcohol or venereal disease. He has read much theology, eugenics and sexual psychology, and is inclined to be very argumentative on these subjects, which he says he always read in preference to the "best sellers". Never read novels for amusement but for what he could learn relating to his own bent. Has evidently dwelt much on sexual matters.

Says that while he gets on well with his parents and appreciates his home he feels he is not understood there, and a lack of sympathy is experienced by him. He entered bank soon after leaving school and has remained in it ever since. For two and a half years he was a junior but his salary was always increased yearly. Manager of his bank reported very favourably on his services during his first five years. Towards the latter part of this time he began to be troubled with weakness in knees and he also then noticed that some inaccuracy was becoming evident in his work, such as placing entries on wrong side of ledger or in counting cash, etc. This became more marked, so that he on one occasion paid out $400 too much owing to his being confused. He found he would tire very rapidly and while able to stand quite well until 12 o'clock, by 3 p.m. he was often utterly tired out. During this period there was an excess of night work. At this time he found it necessary to work on all public holidays. On June 30th last, for example, he began work about 9 a.m. and after a busy day until five he found there was $20,000 to be counted, which kept him busy until 1 a.m. the following morning.

Present illness. He obtained leave of absence on July 2nd, 1916, on account of his condition. For several days prior to this date he found when tired that his knees were weak and legs were heavy, with pains in the calves at times. His writing had been steadily deteriorating but he had no special difficulty in using the pen. He always used a short pen-holder in preference to a long one, because he could write better with it. He had gradually become more liable to make mistakes in addition and was obliged to exert greater effort to avoid doing so, especially when tired, and noticed he always made more mistakes towards the close than at the beginning of the day. He also noticed that in doing an excess of certain forms of work, which were largely mechanical (such as paying cheques on special pay-days), he would make fewer mistakes, although more exhausted after it. He was troubled with frontal headache at these times which was not relieved by glasses. Complained of pain from knees downward in both legs. He was unable to stand for any length of time unless he braced himself to do so. Weakness was fairly constant. Did not complain of his arms. A heavy meal would make him dizzy and bilious, so that he would be obliged in the street to cling to some object or he would fall. He did not think much about his condition at this time. Constipation pronounced. He would tire easily mentally. Was advised by physician to take trip and went down Hudson for ten days. He was, he says, at this time restless, irritable, and tired of everything. Trip not of service. On return did light reading and loafed for about two weeks. He then went to the woods with a friend and knocked about, felt somewhat better and returned August 31st and worked irregularly for a few hours daily for one week and then went on September 5th, 1916, to another city, where he acted as accountant. Work here not heavy for first few weeks, but he was depressed, easily tired, and smoked heavily. During this time he got on fairly well. Gradually, however, he found his work more difficult owing, partially at least, to his own condition. Says he would limp around office, that "he would pull his feet around" without raising them from floor. Did not notice anything unusual about hands, although he had been troubled intermittently since previous spring when he noticed pen would slip from his fingers unless handle was large. He was under medical treatment from November 1st for weakness of knees, general weariness, and an "all in" feeling with sleeplessness, difficulty in adhering to his work although fond of it, and felt he was incapable of doing it after repeated but unsuccessful efforts. This terminated on December 4th in an attack of muscular spasm, general in its distribution. No special cause of which he is aware to induce this attack, except pressure of work as he was both teller and accountant. It came on in evening, when he says he had a feeling of hysteria. He noticed first symptoms at bank of rubbing hands together and extreme restlessness of hands. He then went to see a doctor, who took him home and a complete attack developed, all the muscles of the body being involved, but voice or speech not especially affected. The attack started about 7 p.m., gradually increased and lasted till 1 a.m. He did not lose consciousness at any time that he is aware of. He got out of bed about eleven and went down stairs during a lull, where he found the people much excited over his condition and his doctor was telephoned for. He thinks at this time left leg was more affected, although later in his disease the right leg suffered most. The spasms were at times very violent, and he says they were a great relief in a way as he felt much better after them owing to the tension being relieved. No urinary trouble or bowel movement during attack. On awakening the following morning he had a very violent attack. Later, however, he got up and started for the office, but during this time was much troubled by involuntary movements of hands and feet, which made dressing difficult. He met his doctor on his way to the bank, who promptly sent him back to bed. His speech at this time was not affected. He says his recollection of this whole week (December 4th to 11th) is defective and indistinct, probably because he thought his illness was only trifling and temporary, and consequently did not consider the details with much care, although he had daily attacks of variable intensity. He went home on the 11th and entered a general hospital December 13th. The attacks continued daily. He says he was quite well psychically being cheerful, reading, etc., to occupy his time, and enjoyed visitors, although tired after his friends had gone. He slept much during the day and wakeful at night. He left this hospital December 28th. That afternoon he noticed for the first time that his speech was affected. This occurred when at tea with a friend and his wife, the latter of whom patient was only slightly acquainted with. He said he was not feeling very well this afternoon, being tired and somewhat low-spirited. He noticed for the first time that he stuttered in his speech and this was regarded with amusement both by his friends and himself. From this time onwards it became more pronounced, so that at times he could not form coherent words. The letter "D" troubled him most. His speech heretofore had always been perfect. He was taken to a private asylum on December 30th. After a few days (probably a week) his speech suddenly recovered, and while on one day it was disturbed he found on awaking the following morning that it was normal. It remained all right, except when he was under emotion, such as that which occurred from seeing another patient who was, he thought, being harshly treated, which terrified him, although this patient was very violent and had to be controlled. He said when troubled that he could not find the right words to express the meaning he desired to convey, and that to him the cause of the trouble was psychical rather than physical, and that he did not recognize any physical difficulty in the organs of his voice.

He feels that the right side of body (arm and leg) have always troubled him most.

On first entering the hospital on January 23rd last, one was at once struck with his gait and the disturbance in his speech. He walked with much difficulty, aided by a friend and the use of a cane. His speech was so much affected that he could not make himself understood. He could hear and appreciate all that was said to him, and his actions were intelligent but he could not express himself owing apparently to an inability to articulate. His gait was that of an organic hemiplegia, the right leg being brought forward with a circular motion in a very typical manner. An ankle clonus, typical of an organic disease in its character, was obtained in the right ankle. As he arrived at night and was exhausted from his journey, further examination was postponed, and he was at once sent to bed, leaving one with the strong impression that an organic hemiplegia was present.

On January 27th patient was seized with a convulsive attack involving all his skeletal muscles, lasting about half an hour. These attacks recurred daily for the few following days and then at longer intervals until February 27th, when with the general improvement in his condition they ceased for the time, retaining, however, during this period, their general characteristics, but with much variation in their intensity. Between the attacks he spoke slowly and with evident difficulty, but he could be quite clearly understood. He expressed great anxiety during the first ten days of his treatment, about his mind and said he could not understand why he had been placed among the insane for treatment unless his mind was affected. Constant reassurances from me that I had no anxiety in regard to his mind gradually relieved him, but his nervous condition was much intensified and his sufferings greatly aggravated by his treatment with the insane. As the attacks decreased in frequency the speech and the ability to walk improved so that by the end of March his speech was normal and he could walk for some miles without difficulty. He said he felt very well and desired to give up his treatment. As he still exhibited an unnatural restlessness and a lack of emotional control considerably below normal, I advised him to continue his treatment. His parents, however, did not realize the gravity of his condition, probably owing to reports of his apparent physical health, and contrary to my advice, he left the hospital on April 2nd last. He did not go to his own home but to that of some relatives, where there was a trained nurse in the house. These relatives were excellent people and did their utmost to aid him to maintain his convalescence. The surroundings were as good as could be desired, as walks in the woods with plenty of fresh air, quiet, etc., could all be obtained. Within ten days, however, it was evident he was not so well and the mistake in his removal from direct medical care became evident. On April 13th, after the receipt of a telegram from his home suggesting a change in his plans which were not in accord with his wishes, he developed a severe convulsive attack which was followed by inability to walk, and he was brought back to the hospital. He attempted to walk into the building with the help of two friends but he was practically carried in, his legs dragging uselessly after him. He was at once put to bed and developed a severe convulsive and very noisy attack, lasting about three-quarters of an hour, after which he became quiet and passed a good night. As he had no further attacks at this time he gradually recovered his ability to walk so that in ten days he could get about fairly well with the use of a cane and within one month his recovery of the use of his legs seemed complete so that he could enjoy all kinds of physical exercise. The improvement in his mental tone was also very noticeable, his confidence in himself and his self control being much better. As he was so much improved it was thought advisable to permit direct communication with his home, which had hitherto been entirely denied to him. The result, however, was not satisfactory (I may add there was no other change in his treatment or surroundings at this time), and he developed two slight convulsive attacks, one on June 3rd and one on June 4th. Both these attacks were much modified in their severity in comparison with those he previously experienced, and in a few days he was continuing his progress towards recovery. The outlook at present is for a complete restoration to his normal health, and if nothing unforeseen happens, I expect to send him for a long canoe trip about the first of July with the confident hope that he will be able to resume his work on his return.

In a paper necessarily much curtailed in view of the variety of the details during a prolonged illness, only a *general review* of some of the most striking symptoms can be given. The attacks were often preceded for a few days by disturbances of the alimentary canal such as constipation, anorexia, complaints of biliousness, and a general feeling of malaise which were not relieved by ordinary measures. In addition, at these times, he was irritable, fault-finding and discontented. The immediate cause of the attack was apparently some disappointment, usually slight, in his wishes, such for example as the denial of some amusement, the refusal of a cigarette, etc. This latter was at once followed by physical restlessness, such as tapping of the ball of one foot on the floor, rubbing of hands, and inability to sit quietly in a chair. Then he would begin to walk up and down at first pounding his feet heavily on the floor as though endeavouring to overcome his muscular irritability and control the attack. After a few moments of these efforts, the feet would gradually become stiffer in their action and he dragged or rather scraped along the carpet so that in a moment further locomotion was impossible and he would fall headlong on his face, without, however, doing himself any serious injury. He then would be seized with clonic convulsive movements, general in their distribution and equal on both sides of the body. This was accompanied by inarticulate voice sounds, variable in their intensity and with an occasional explosive sound resembling somewhat the bark of a dog and evidently produced by a spasmodic contraction of the diaphragm. The muscular movements were not extravagant and only on one occasion did he throw himself out of bed. Neither his pupils, respirations, nor colour of his face suggested an epileptic attack. His consciousness although dimmed was not at any time completely lost. The convulsions ceased gradually and were not followed by sleep. The attack usually lasted from one to three quarters of an hour. His memory of what had taken place during the attack was hazy but not lost. Between the more frequent attacks he was in a dreamy condition. He was apparently awake and replied correctly to all questions, but spontaneity of thought and expression was very defective. He appeared at times intensely sleepy and would pass into an intense sleep for several hours from which he could only be aroused with difficulty. On being awakened he appeared like one aroused from the profound sleep following complete exhaustion. After an attack both his speech and his gait were more affected.

The physical examination showed a well nourished young man in apparent health. The deep reflexes were all somewhat increased but equal on the two sides of his body. No ankle clonus could be obtained after the first examination. The superficial reflexes were all present and active on both sides, except the plantars which were absent. There was no Babinski; no stereognosis. The cutaneous sensibility showed a marked dissociation. Tactile sensibility, with location of touch, and sensibility to heat and cold were everywhere good, except the conjuctival reflex which was absent in right eye. Sensation of pain, however, was markedly disturbed, the right leg being completely analgesic and the skin of it could be everywhere transfixed by a needle without eliciting more than the sensation of touch. The entire right lower extremity was thus affected and was sharply limited above by a line corresponding to Poupart's ligament and the crest of the ilium. The left lower extremity was similarly affected but to a lesser degree. Sensibility to pain on right half of face, tongue, trunk and right upper extremity were somewhat diminished, especially on comparison with the corresponding areas on left side which seemed in comparison hypersensitive to pain. The eyes presented the ordinary stigmata of hysteria, the fields of vision being concentrically contracted to about one third of their normal extent. The optic discs, the pupillary reactions of the eye movements were all normal. The examination of the muscular system was most interesting as it showed no paralysis or even weakness of any muscle or group of muscles in the body when resistance was applied in the ordinary manner. There was no incoördination of muscular movement and a passive movement on one side of the body could be imitated quite well, with the eyes closed, on the other.

He stands as well with eyes closed as when they are open, being unsteady in both instances. His weight chart shows a gain of 7¼ pounds in weight. Urine normal and other organs healthy. No increase of temperature at any time.

The history of hysteria dates back to the very dim past. You all know of the old reverie of Plato in which he states that "the matrix is an animal which longs to generate children and when barren, it feels wroth and moves about the whole body, closing the issues for the air, stopping the respiration and occasioning various diseases, etc.". When this belief held sway it was the reign of sibyls, witches, convulsionists, etc., the malady supposedly affecting females only. It was not believed that males were affected until the time of Raulin, who, in 1758, was the first to maintain that there were hysteric men. This changed the old conception of hysteria, as is shewn in the more recent works of Brodie in 1837, Bracket and Landouzy in 1845, Duchenne de Boulogne in 1855, Briquet in 1859, and more latterly Charcot, who founded the clinic at the Salpetrière and among whose pupils none have written more brilliantly on this subject than Pierre Janet. I mention a few of these great explorers of the domain of hysteria in order to emphasize the fact that while different explanations of the phenomena of hysteria have been advanced from time to time, the basic symptoms of this wonderful disease have ever remained the same in all ages and in all races.

Might I here be permitted to add, in humble tribute to a great master, that it was in following the teachings of Charcot and in watching his clinical demonstrations for a considerable period, that I received a profound impression of the importance and reality of the symptoms of hysteria, an impression which time has served only to intensify. While the various stigma of hysteria as noted in the above history each merit a careful separate study, such as the disturbances in the digestive system, in the eye, in the cutaneous sensibility, in the speech, and also the disturbances in the muscular system, such as the convulsions, and the paralysis, a lack of time forbids a discussion of more than one of these stigmata.

In a previous paper on "Some eye symptoms in hysteria", I endeavoured to discuss the chief disturbances of vision met with in this disease. The disturbance of speech, associated as it is in the above history with a lesion involving especially the right half of the body, is most interesting from its possible anatomical relations, this being emphasized by the fact that in the earlier stages when the left leg was chiefly affected no disturbance of speech was noted.

May I now refer to one of the striking objective symptoms, viz., the motor paralysis—how paradoxical does it appear that a man with good muscular power in his legs is unable to walk! Yet in this strange disease many such cases have been recorded in which with a total inability to walk the patient could jump, hop, or skip, or do any muscular movements with his legs while in the recumbent position. We have been so accustomed to assume that a patient who is suffering from a paraplegia is not only unable to walk but must have a paralysis of all forms of motion in his legs, that when any of these latter are retained we are at once inclined to regard him as a malingerer or simulator and thus relieve ourselves of the trouble of further and serious investigation. Is this justifiable? I think not, in a disease in which the same symptoms have been described by competent observers and in all nations and classes for centuries. Grant if you wish (however absurd the proposition) that knowledge of all the symptoms of hysteria are known to those patients, how many would be able to stimulate them in their entirety for one day, not to mention the weeks and months or even years during which these symptoms may persist. Moreover, the fact that many of the symptoms of hysteria are unknown to the patients themselves, and are only discovered by the careful examination of a physician (for example the eye symptoms), shows clearly that a simulation of this disease as a whole is impossible. Certain isolated symptoms may be feigned for a purpose, but a knowledge of the disease, with all its definite manifestations, will enable the physician quickly to detect the malingerer.

Let us now, however, "*revenir à nos moutons*" and discuss further the cause of this inability to walk. In considering this it would be well to mention also other corresponding troubles which occur in hysterics in the upper extremities, in which some functions of the hands are lost, such as a needle woman becoming unable to sew, an ironer to handle an iron, or an inability to write or play the piano, although there is no paralysis of the hands. Such instances as these, as Janet says, are sufficient to prove that there are very often systematic paralysis, in which a certain system of movements, grouped by education, separates from consciousness and takes an existence of its own. There is a dissociation of function here, due to lack of conscious control—an amnesia of the movement—which prohibits function in regard to this movement. Suppose, for example, an individual learns to drive an automobile, the use he makes of his feet and legs, develops a new function for his lower extremities and groups together images in a fresh centre which have never been grouped before. Should he by any chance forget this new function at a later date it need not prevent him from utilizing all the other functions of his legs which he previously possessed, such as walking, etc. Is there an anatomical basis for many of the stigmata of hysteria? It is highly probable that the functional association corresponds to an anatomical association but this can only be elucidated by further study. On one point, however, we may be certain, viz., that the starting point of hysteria is in a disturbance of the higher functions of the encephalon.

If these few and very imperfect remarks will serve to stimulate the study of this most important disease, which offers such a broad field for both psychical and somatic investigation, I am sure an abundant harvest will be reaped by all who cultivate it, more especially as the numerous cases of so-called "shell shock" return from this terrible war, in which the nervous strain is unprecedented in the history of the world.

A SHORT SERIES OF CASES OF CARCINOMA OF THE CERVIX UTERI

By C. E. Holbrook, M.D.

House Gynæcologist, Royal Victoria Hospital, Montreal

DURING February of the present year we were struck by the unusually large number of cases of carcinoma of the cervix uteri admitted within a short time to the gynæcological ward of the Royal Victoria Hospital. Having so many cases at one time has prompted us to report them, and I am indebted to Dr. Chipman and Dr. Fraser for the privilege of doing this.

There were in all ten cases. It is noteworthy that five of these were very young women—aged twenty-six, twenty-nine, thirty-one, thirty-one, and thirty-two years respectively. Three others were in the forties; one was fifty-two and the other sixty-seven years of age. All the women were married, but two of them had never been pregnant, thus affording an instance of cancer of the cervix uteri in nulliparæ. Of the two nulliparous women, one had never menstruated except a few times at the onset. She is now thirty-two years old.

The Wassermann reaction was negative in every case. The blood count did not show anything characteristic. All had a moderate leucocytosis of ten thousand to twelve thousand. One advanced case, and one case with a pelvic abscess showed large leucocyte counts.

All had secondary anæmia of varying degrees. There were no abnormal red cells. Only two gave a history of carcinoma in the family.

The important symptom in every case was bleeding. The amount varied from spotting to a profuse hæmorrhage. Two cases had a good deal of leucorrhœa early in the disease. Pain is a late symptom, and was not present at all in some of them.

I would like to give you a little of the histories they gave. It is interesting to see how long some of them bled before consulting a physician.

1. Mrs. F.—8628, gynæcology—age sixty-seven years. Began

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to bleed per vaginam seven years after the menopause and has continued for the past thirteen years. Ten years ago she had a curettage and hysterectomy was advised, but for some reason refused. The long duration of this case is an example of the different degrees of resistance offered to carcinoma by different individuals.

2. Mrs. F.—8591, gynæcology—age fifty-two years. She began to bleed five years after the menopause. She bled five months before going to a doctor. He did not make any vaginal examination, but gave her some medicine to take.

3. Mrs. R.—8627, gynæcology—age forty-three years. Began about July, 1914, with a flooding. She thought it was an abortion. Since then has had menorrhagia and metrorrhagia. Leucorrhœa and pain after about one year.

4. Mrs. L.—8634, gynæcology—age thirty-one years. Had a foul-smelling bloody discharge six weeks before going to a doctor. He examined her thoroughly, and said she had carcinoma. Sent her to the hospital. This is an operable case.

5. Mrs. S.—8624,—age twenty-nine years. She had bled two months, then came to hospital first.

6. Mrs. McG.—8500, gynæcology—age thirty-one years. Began with spotting after periods, about five years ago. For the past two years spotting a little every week; gradually increased to daily red spots. Profuse leucorrhœa along with spotting. She did not consult a doctor for about one year after spotting began. Pain came on very late in this case.

7. Mrs. R.—8632—age forty-eight years. Began about six months ago with foul leucorrhœa. About one month ago had a severe hæmorrhage, which her doctor thought was a miscarriage. He packed her and sent her to the hospital. She had practically no pain.

8. Mrs. B.—8611—age twenty-six years. She has been losing blood per vaginam for the past three years. Never consulted a doctor before coming to the hospital. Has had pain for the past six months only. This is an advanced case, with a pelvic abscess.

9. Mrs. D.—8645—age thirty-two years. She never menstruated after a few times at the onset, so when she began to lose blood in June, 1916, she thought it was the menstruation returning. When it did not cease after several days she saw a doctor. She has been undergoing local treatment for the past eight months. Admitted March 7th, 1917. This case is still operable.

10. Mrs. H.—8348—age forty years. She was bleeding six months before going to a doctor. She was then treated for six months in his office. No definite diagnosis was given, although she had severe hæmorrhages following the treatments. She was admitted to the Royal Victoria Hospital in October, 1916, with an inoperable carcinoma.

Of course the all important question is treatment. I think all agree that in an operable case the treatment is radical removal with the knife. What do we mean by an operable case? It is one where the disease is confined to the cervical cylinder, or the body of the uterus, and in which the vagina, bladder, rectum and parametrium are not involved, and the uterus is freely movable. Unfortunately, the majority of cases do not come until they have passed the operable stage. Six of our cases were inoperable.

What palliative measures can be employed in the inoperable cases? Three of the best are formalin, iodine, and cauterization by heat. The principle is the same in all. They clean up the growth, get rid of the secondary infection and consequent foul discharge, diminish or stop the hæmorrhage, and cause more or less cicatrization or fibrous change.

We are particularly concerned to-night with the method of cauterization by heat through the medium of the electric cautery of Percy. There are two ways of using the cautery,—at high and low temperature. It has been demonstrated in the laboratory that carcinoma cells are killed by a temperature of 113° F. maintained for ten minutes. Percy is a strong advocate of low heat. He maintains that it does not char or carbonize the tissue next to the cautery, but coagulates it throughout the tumour mass. His operation is to open the abdomen, insert the cautery point to the fundus at a low temperature, and use only as much heat as an assistant (who holds the fundus in his hand) can stand. The uterus is cooked for an hour, or until there is no further fixation. If there is thickening in the broad ligaments the cautery point is directed into them also, until they too lose their fixation. Byrne was an early advocate of high temperature. Here the cautery is at a red heat—temperature approximately 800° F. The tissue is quickly charred.

Many unfavourable results have been reported following the use of the cautery. Leonard, of Baltimore, states that the sequelæ are practically those following superficial burns, due to the toxic products of broken-down proteid from squamous epithelial cells, *i.e.*, gastric and duodenal ulcers, hæmorrhagic exudates into the serous cavities, particularly the pleura and pericardium, degenerative processes in the central nervous system and epithelial necroses in the parenchymatous organs, particularly the kidneys. Injury to the red blood cells also occurs at 113° F. Hence the ligation of the internal iliacs and ovarian arteries, which is frequently practised before cauterization.

The cases reported here were treated with high temperature, *i.e.*, the cautery was at red heat and the abdomen was not opened. Three of the cases were cauterized in this service at some previous time.

Mrs. R.—8627. She was first seen in July, 1915. The cervical cylinder was the seat of a cauliflower-like growth. The uterus was fixed. There was infiltration in both broad ligaments. She was considered inoperable. The Percy cautery was used at red heat. A piece of the growth was cut, and showed typical squamous cell carcinoma. On discharge the uterus was fixed and a nodule was felt in the left parametrium. She had no more bleeding, not even any menstruation, and she was readmitted February 24th, 1917, nineteen months after the first cauterization —complaining of cramp-like pain in the hypogastrium. The uterus was large and cystic, but fairly freely movable. The abdomen was opened, and a panhysterectomy done. The cervical canal had been obliterated and the menstrual blood retained. This accounted for her colicky pain. The parametrium on the left side of the uterus was involved, and a small area at the base of the left broad ligament remained. The microscopic slide from the fundus shows a growth very atypical of carcinoma. It is very fibrous, with only a few scattered areas of cancer cells. It is remarkable what an improvement there was here. After a year and a half she was better than when first seen. Of course a great deal of the fixation when first seen must be explained as inflammatory.

Mrs. H.—8348. Was first seen October 9th, 1916. Carcinoma was at the level of the internal os. The parametrium was involved. The case was inoperable. She was bleeding a good deal. Cauterized with the cautery at red heat. She was re-admitted in March, 1917, after five months. There had been no further bleeding, but a foul leucorrhœa—but the condition was wonderfully improved. There was a fibrosis, or cicatrization. The condition, however, is slowly involving the parametrium and bladder. She was cauterized again at the second admission.

Mrs. M.—8004. Was first seen in April, 1916. The cervix was eroded, and was the site of an extensive, rather firm cancerous growth extending to the vaginal wall and parametrium. The condition was hopeless. The canal and uterus were cauterized. In May, one month later, she was discharged with the cauterized surface well healed—no tenderness. After a few months she developed pelvic pain which radiates down the thighs, due, no doubt, to infiltrated nerves. However, there is no bleeding, and she has passed almost a year without much progress of the disease.

Three of our cases ran a septic temperature after cauterization. One of these, however, was septic before, from a pelvic abscess. There are three modes of death in these cases:

1. Hæmorrhage.
2. Blocking of ureters with ascending infection.
3. Obstruction of the bowel.

One operable case of cancer of the uterus with ovarian cyst was up and about the ward only last week. She was suddenly taken with a very free hæmorrhage and almost bled to death, although a house surgeon happened to be in the ward at the time and packed her immediately. She recovered, following a subcutaneous saline, but had minor hæmorrhages almost daily following, and died March 26th, 1917. Autopsy showed an extensive erosion of the body of the uterus, with entire absence of the cervix. There was extensive infiltration into the surrounding tissue and a vesico-vaginal fistula, probably the result of the packing necessary to control the hæmorrhage.

One other case came to autopsy and showed (beside the carcinoma of the cervix with extension into the parametrium) a pelvic abscess, septicæmia and a sero-fibrinous pleurisy on the right side, not, however, any hæmorrhagic fluid in any of the serous cavities, and no gastric ulcers.

In conclusion, we cannot be too careful to find out the cause of bleeding in women, especially after the menopause. The treatment of carcinoma of the cervix or of the body of the uterus is radical operation, where the condition is an operable one. In inoperable cases, the best treatment is the Percy cautery at red heat.

THE DEFICIENCY DISEASES OF INFANCY AND CHILDHOOD

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THE term vitamines was introduced by Casimir Funk in 1912 to designate certain organic bases, the importance of which was recognized as the result of experimental studies on beri-beri. It was demonstrated that the ætiology of the peculiar disease was associated with the lack of the above substance in foods, which has been deprived of the important elements contained in the outer layer or husk of the grain of cereals by too extensive milling, or by the consumption of a diet subjected either to prolonged heating or heating under pressure.

The name vitamines has been applied to these substances for two reasons. In the first instance they are undoubtedly proven to be indispensable to life. It is not exactly known what their physiological function is, but the assertion that they are indispensable is an indisputable fact. In the second place they belong to the class of organic bases exhibiting certain specific chemical characters. A better plea cannot be brought forward in support of the appellation vitamine, than by referring to the well-known fact that an animal is able to live longer when food is withheld altogether than when all the known constituents of a diet, with the exception of the vitamines, are supplied to it.

The chief chemical properties so far observed are that they are isomers of adenine and soluble in alcohol readily obtainable from yeast through precipitation with a colloidal hydrate aluminium silicate preparation known as Lloyds' reagent. The various vitamines are destroyed by different degrees of heat and hence become inactive.

With regard to the physiology of the vitamines, it cannot be explained as yet why these substances are so indispensable to

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the animal organism, but certain facts in this connexion which have been gathered so far must be mentioned. First, Funk found that animals fed on white rice showed very marked changes in the chemical composition of the brain. This finding is possibly important, as the most characteristic feature of deficiency diseases is a group of symptoms arising from the central nervous system. It is possible that these changes are due to the half-starved condition of the animals. Another important fact which was discovered a short time ago is that a definite relationship exists between the onset of certain deficiency diseases and the amount of carbohydrates consumed. It was already known for some time to those who had studied beri-beri from the clinical standpoint that with an increase in the consumption of polished rice, the onset of the disease can be hastened. It is also known that deficiency diseases in childhood (especially rickets and tetany and probably scurvy) occur when proprietary foods consisting chiefly of starch make up the bulk of the dietary, this observation we have fully confirmed in the wards and laboratory at the Children's Hospital.

With regard to the influence of vitamines on metabolism some important facts are known. Although the measure of their importance on metabolism is at present obscure, active experiments have demonstrated that in the absence of vitamines the entire metabolism of organic and inorganic constituents goes wrong, especially is the relationship between the $\frac{NA+K}{CA+MG}$ interfered with.

In the various researches in diseases of children of to-day, no group of abnormal conditions has received such intensive study as rachitis, scurvy, tetany, osteogenesis-imperfecta, infantile beri-beri and pellagra, these diseases, especially the first four, class themselves under the one heading, deficiency diseases, as they are more or less interrelated ætiologically, possess a striking similarity in symptomatology, and respond to a greater or lesser degree to an allied therapy.

Up to the age of six or seven months, in many cases longer, an infant is fed exclusively on milk. Under normal conditions there is no doubt that mother's milk is an ideal infant's food, but in these days the force of circumstances or numerous other factors, not ordinarily granted much deserved attention by the medical attendant, may so change the composition of the mother's milk that it ceases to be a complete food. This failure to be a complete food cannot so far be demonstrated in the laboratory by the ordinary chemical analysis, an analysis to which so many practitioners have attached so much importance. One need not go further than to observe the well-known fact that frequently, during pregnancy and lactation, mothers will desire and seem to exist upon a diet which is badly chosen from the standpoint of our recent knowledge of modern physiological standards. We are all ready to admit that frequently these abnormal cravings are in the direction of articles of diet which have a very doubtful nutritional value and from our standpoint also very doubtful powers of maintaining a metabolic balance. May we not, therefore, analyze the congenital deficiency diseases, or those appearing soon after birth in breast fed babies, as deriving causative faction from the deficient maternal diet just referred to. Sufficient analyses of much milk have been made, however, in the case of mothers where nursing infants have died from infantile beri-beri, to show that the lacking factor in the diet cannot be a deficiency in proteins, inorganic salts or even fat and as the infantile malady can be cured precisely like the adult type, by an administration of an extract of rice polishings, it seems logical to conclude in the light of present knowledge that the two are caused by a deficiency of the so-called vitamines. It is likewise probably true that the maternal organism is unable to synthesize vitamines unless they are supplied in the food to the lactating mother. These important facts are not generally known by those who have developing and growing children in charge, and as a result we have a deficiency in the metabolic requirements in many breast-fed infants, with scurvy or rachitis, or both, as frank manifestations and "difficult feeding cases" with even less understood ætiology as more occult manifestations. The above facts are also in perfect agreement with the plentiful evidence that the deficiency diseases of later life, markedly osteomalacia, occur more frequently in the female and more especially during the child-bearing period. We can easily verify all these facts by the animal experiments which have been reported by many observers. Unusual physical exertion also requires not only additional calories but also additional vitamines, and especially is this true when unusual demands are made upon the powers of the carrying or nursing mother. Pigeons if forcibly exercised and plentifully fed on polished rice develop severe symptoms of beri-beri while controls at rest and on the same diet during the same period of time remain far less affected; in fact pigeons at rest may remain free from any discernible symptom of beri-beri for an unusually long time even though fed on an exclusive diet of polished rice and then, if suddenly exercised, will develop all the symptoms of beri-beri in a few moments.

From these observations we will now pass to the consideration of the artificial feeding of infants on modifications of whole cow's milk, and in handling this problem there are two main points of consideration. First, when milk is subjected to certain degrees of heat either by sterilizing or pasteurizing, experiments recently conducted go to show that the destruction of vitamines or growth element content is destroyed at certain degrees of temperature. Neuman and Heubner conducted investigations years ago which showed conclusively that infants fed on pasteurized milk entirely may develop scurvy. These researches were disregarded for a number of years, in fact their results were questioned by some for a long time. To-day the same evidence which was brought forward by Neumann and Heubner is finding growing acceptance. The fact that orange juice might be given as early as the first month with benefit was admitted by several observers years ago. Recent evidence tends to show that in over-heated milk the factor which disturbs the normal metabolic processes of the nursling is not a chemical change in the casein or other protein of the milk as McCallum believes, but is due, as has been proven by recent observations, in which the author in conjunction with Dr. George Smith has been particulary interested, to the inactivation of a definite substance in raw milk which prevents pigeons fed on polished rice from developing beri-beri in the usual length of time. Undoubtedly a vitamine. Secondly, the growth element content of cow's milk is by no means a constant factor; it is entirely dependent on the same, or at any rate similar conditions among cows, as has just been discussed in regard to nursing mothers. More particularly does this deserve our attention when we recall that in the summer the cows, or other milk-giving animals, gain their supply of fresh food directly from pasturage, while in the winter the food has been subjected to drying, curing and storage, all tending toward inactivation of the vitamine content. Actual epidemics of deficiency diseases among calves and then cows have been described by Lötsch as occurring during the winter in the poorer districts of Switzerland. There is no doubt that if more attention were centred upon these facts that many cases of rickets, as well as some of the other deficiency diseases, would find an ætiology more definite than that with which they are at present dismissed.

Passing to the child of runabout age, why is it that the deficiency diseases are still manifest when food other than a pure milk dietary is offered. Highly milled cereals cooked interminably to say nothing of the amount of starch solutions already forming the diluents of feeding formulas, were previously prescribed in most cases. Actual experiments upon rats fed with certain of the so-called patent foods have proved beyond doubt that most of such preparations are not sufficient to maintain life, to say nothing of promoting growth, though they contain enough protein substance with all the "necessary amino acids" as laid down by Osborne and Mendel. One may argue that the results obtained in rats may not apply to human beings. Granting that, we still learn that something is missing in certain of these foods, a something which was probably destroyed in the process of its manufacture, since the test animals thrive very satisfactorily if they are fed with the raw materials from which most of these foods are made, or else if some adjuvant containing the missing substances is added to the baby food. The "missing substance" is contained in fruit juice and yeast and both must be administered to make a complete food for the rat. In the added fact that babies fed on the above food, exclusively, are the commonest victims of the deficiency diseases, especially rachitis and scurvy and tetany, we have the "evidence before the fact" as the lawyers put it.

Now we know from the researches of Funk that the foremost functions of the vitamines are to influence carbohydrate metabolism, especially that of the starches, and that when this substance, or these substances, are not present in proportionate amount to the increased starch content of the dietary the metabolism fails, its balance is destroyed and the patient suffers from the minor or major manifestations of disturbed nutrition or growth, entirely independent of the caloric value of his food intake or its inorganic constituents. Be it in its mildest form of so-called "difficult feeding cases" or in the severest form of rachitis or even death, the cause is the same and the resulting condition simply a matter of degree. What is our problem therefore? Either to diminish the quantity of carbohydrate, principally the starches, or else to supply substances such as fresh or very lightly cooked vegetables, or certain extracts which are known to obtain a marked excess of these essential substances. To do the former would mean a loss of calories to the child; to do the latter rarely fails to prove of decided benefit. It is held by many of our most prominent students of nutrition that excessive housing or other unfavourable hygienic conditions are prime factors in the production of deficiency diseases, especially rachitis; this belief received a great impetus in the publication of "Kassowitz" in which he put forth his famous "domestication theory" as an ætiological factor of first importance in the production of deficiency disease in animals. Recklinghausen and others could not confirm his observation. Observations upon animals used by Funk in his experiments on nutrition showed them to be in better condition than others living amid better hygienic surroundings. They were found to be nearly double the size of normal animals, gave no signs of deficiency disease and their offspring were far superior in vitality and growth to those born to animals living under normal conditions. We do not advance this as an argument against proper hygiene in the care of our babies, for it is certain that had the animals lived amid better hygienic surroundings in addition to their high vitamine diet they would have done even better; what is really to be emphasized is the inadequacy of the theory of poor hygiene as the fundamental cause of the deficiency diseases. All of us have seen rickets amid the best hygienic surroundings and have failed to find it universal amid the very worst hygienic conditions. The same applies to all the other deficiency diseases. Other things being equal, however, hygiene undoubtedly plays its part in determining their progress and outcome, as it does in all other conditions and diseases with which we are concerned in our daily work.

Lastly we have the problem of the child with its likes and dislikes toward certain articles of food and the degree to which those who have the child in charge cater to its wishes. Let us take as our examples the children between the ages of two and four years for, after all, it is every man's experience that children affected, for instance, with rickets show improvement before the expiration of that period. The explanation is simple if we remember that about this time the diet is varied and includes many fresh foods, such as juices, fruits, fresh vegetables and the like, which if not overcooked are rich in active vitamines. These substances have, in such cases, again exerted their corrective influence, thereby bringing the metabolic standard up to its proper level. Many children, in spite of this, unfortunately, are permitted an excess of foods rendered poor in active vitamine by overheating; add to this excessive carbohydrate to tickle the palate, crackers, bread, sweets, etc., between meals, or in excess at meals, and we have fertile soil for the development of one or the other of the deficiency diseases. As the origin of a "vicious circle" we find an idle effort made on the part of their attendants, perhaps under professional advice, to offset the evident substandard development of the child by the addition of more of the "foods" just given as samples, thereby not only spoiling their appetite for foods they should have, foods rich in active vitamines, but maintaining the very state of metabolic deficiency which they are attempting to combat. This furnishes us a reasonable explanation for the many cases of overfed weaklings and "substandards" that we see, and gives us at least a clue as to how to comfort the heart broken mother who gives her progeny "every care" and "the best of food" and yet fails to bring him up to the standard of the "neighbour's baby" who, by the way, "is not nearly so well taken care of." Cases of "persistent rickets" give us no more difficulties as to ætiology, and many hints as to treatment, if we remember the facts just presented.

A most important fact to note in relation to this discussion is that all of the deficiency diseases enumerated, as well as many allied conditions of similar origin overlap in their main symptoms. True, certain characteristic symptoms especially diagnostic of one or the other of the diseases just mentioned may stand out more prominently in that disease and so mislead one into the belief that no interrelation exists; but a careful study cannot fail to reveal an undeniable similarity of symptoms, taken as a whole, among apparently dissimilar conditions with correspondingly dissimilar names. All seem to find a common cause in some form of vitamine deficiency in the food. Furthermore, of paramount interest is the fact that each, if studied by means of the metabolism-bed shows a negative balance of the inorganic salts, such as calcium, magnesium, phosphorous, and sulphur. It is not the purpose of this paper to go into the minute symptomatology of each of these conditions at this time, as this has been done many times by others and is sufficiently familiar to all, but it may be of service for the purposes of this paper to point out an overlapping of symptoms in the diseases under consideration. Hæmorrhagic tendencies are most marked in scurvy, less marked in pellagra (though often present to such a degree as to present difficulties in different diagnosis) frequently seen in beri-beri, often seen in rachitis and osteomalacia and have been reported as occurring in cases of osteogenesis-imperfecta. Gastrointestinal symptoms are very common in pellagra, very common in scurvy, always present in beri-beri, and very frequently in rachitis. The nervous system is particularly vulnerable to all forms of deficiency disease. Whether it be a hyper-irritability, a spasticity, a peripheral neuritis, a central neuritis, or the manifestations take the form of convulsions, of pain or of palsy, they are present to a greater or lesser degree in each and every one of this group of diseases. We need not individualize, but the most superficial comparison of the ordinary disturbances of the nervous system found in one, with those found in another, leave nothing lacking as far as similarity or analogy is concerned; whether the influence upon the nervous system be interpreted as direct or indirect it reverts to the metabolic deficiency as the basis of it all. Skin symptoms are common to all of these diseases either in the form of eczema, an urticaria, a dermatitis or purpura, or a combination of two or more of these eruptions may appear at the same time, or in sequence. Obviously no marked improvement will appear in the eruptions until the metabolic deficiency at the bottom of it has been dietetically corrected. Perhaps the successful practice of withdrawing or diminishing the sugar content in the diet of the eczematous child or one with spasm of some portion of the respiratory system with a rachitic basis, may find its explanation in the withdrawal of just so much carbohydrate as overwhelmed the amount of vitamine taken in the daily diet of the child. Chronic or acute changes in the skeleton, especially in the long bones, are too well known and so generally apparent in all of the deficiency diseases that neither space nor time need be given to their discussion here. Blood changes ranging from a simple anæmia of short duration to the very severest blood pictures lasting over long periods, perhaps through life, are common to all of the deficiency diseases depending upon their severity or duration. Changes in the ductless glands have been so marked in practically all of these diseases that reasonably enough the gland disturbance has often been looked upon as the ætiological factor in the disease in which it was affected. Perhaps it is the ductless glands upon which the unbalanced diet works its first havoc and then the abnormal secretion of the particular gland affected determines the nature of the deficiency disease which manifests itself. This is a matter for future research to decide. Vitamines may be substances out of which the ductless gland obtains some element necessary to the elaboration of its specific secretion. Lastly, and perhaps due to cases just cited as speculative, we find in all classes of deficiency disease of one type and another, more or less marked hindrance to the normal growth and development of the entire organism, the degree being dependent upon the duration and previous intelligent efforts made towards a cure. This, after all, is the most important factor to be considered in the case of this class of disturbance.

We now come to the therapeutic principles underlying the management of these cases which also seem to substantiate the writer's belief in their common origin and interrelation. Regarding scurvy there is but little to add to what is already known in relation to its successful treatment. We fully recognize the causative factors and have no further doubt as to the value of fresh extracts, especially fruit juices in the treatment. There never was any question as to the frank cases with typical symptomatology which were seen at five or six months, but the more recent researches have confirmed the already known facts that an early scurvy, characterized by a deficiency in growth and nutrition without other discernible symptoms, is very common and can be offset by the use of anti-scorbutics as early as in the first month of life. What are the anti-scorbutics? Vitamine containing substances possessing the same general chemico-physical properties as substances containing anti-beri-beri vitamine. Therapeutically and physiologically, in the light of our present knowledge of these substances there may be a difference between the various vitamines. For example, Hess claims no therapeutic result from the use of autolyzed yeast—a substance containing an enormous amount of the anti-beri-beri vitamine—in the treatment of his cases of scurvy. On the other hand, the author has found that autolyzed yeast has at times some anti-scorbutic and growth-promoting value if used in sufficient dosage. Recent animal experiments carried out by Funk show that, although the vitamine contained in fruit juices is far better adapted for the prophylactic or curative therapeutics of scurvy than the form contained in autolyzed yeast, still there is no doubt that the anti-beri-beri vitamine of autolyzed yeast has some effect as an anti-scorbutic, while fruit juices have some effect on the retardation of beri-beri in pigeons fed on polished rice for the usual length of time. It need not concern us, however, as to whether the vitamine of fruit juice or that of autolyzed yeast influences the condition towards a cure, nor whether a different vitamine is concerned in each case. Suffice it to say that such a substance or such substances are concerned in correcting the deficiency of metabolism known as scurvy. Passing on to the therapy of beri-beri, or what the writer believes to be an identical condition of milder degree "Mehlnahrschaden" in infants kept too long on cereal decoctions, we find a striking analogy in the prompt results obtained from the use of vitamine-containing substances; in these cases, however, the substances contained in autolyzed yeast seem to exert a better influence than that contained in fruit juices. More and more evidence is accumulating from day to day in support of the deficiency basis of pellagra, a condition not as uncommon in children as may be supposed. The ætiology of this affection which seems to stand the test of experience the best was thoroughly worked out and described in Funk's book "Die Avitaminosen" and has more recently been verified by Goldberger's work.

We now come to the consideration of rickets and such allied conditions as osteogenesis-imperfecta and osteomalacia, for, after all, if we study the conditions under which the last two diseases appear, and also study their main symptoms, we find that the time of life at which they appear plays the main rôle in differentiating them as pathological entities. Osteogenesis-imperfecta is most active in the formative or fœtal period, rickets is most common in the growing period, and osteomalacia in the adolescent or adult period when new functions or requirements are suddenly thrown upon the metabolism without proper precautions. All three at periods when a more active metabolism than merely vegetative becomes a necessity. Now, if we are willing to accept these last named conditions as deficiency diseases upon completely the same footing as we do scurvy, beri-beri and pellagra, we shall come far nearer an ultimate solution of the most complex problems which they may present than from any other standpoint. Furthermore, if we accept them as avitaminoses as Funk has suggested some years ago we will find ourselves still closer to a solution of the ætiology and, therefore, therapy of the condition. From the very earliest days since the recognition of rachitis as a pathological entity cod liver oil has been considered the most efficient remedy in the treatment of the disease. To this remedy were added the various adjuvants in the way of mineral salts, believing thereby to supply them for use to the tissues, failing, at the same time, to appreciate the fact that in the overwhelming majority of cases the tissues were receiving through the food an ample supply of these salts, but that the trouble lay in the fact that owing to some grave fault in the body economy they were not able to retain them. As time went on results obtained from cod liver oil were not as uniformily encouraging as the earlier reports seemed to indicate. Among the various explanations of this discrepancy of result none seems more rational to the writer than the probable destruction of vitamines as the result of the manifold processes of refinement to which cod liver oil has been more recently subjected. The crude oil has been proven by actual experiment upon the various animals to contain a very considerable proportion of an exceedingly active vitamine which vitamine is either partially or totally inactivated by the various processes of refinement and has been demonstrated in some of the discarded fractions of the oil. Funk has shown that a fraction which he has isolated from the crude oil and which is in many cases absent in the highly refined oils is curative of beri-beri in pigeons and preventative of a condition identical with rachitis found in chicks. In judging the value of vitamine therapy in rachitis one must bear in mind that we are dealing with deficiency of metabolism very much more chronic than in the case of scurvy or beri-beri, and, therefore, the symptom complex is much slower in developing than in the other conditions mentioned; furthermore, in the cases of longer standing the anatomical mal-developments resulting from abnormal growth, as an aftermath of an undue proliferation with or without subsequent resorption of what would otherwise be normal cell or tissue constituents, produce deformities or weaknesses which only time can, to a greater or lesser degree, under favourable conditions, regulate by compensatory growth. Cases of rachitis in which tetany is present respond especially well to an increase in daily vitamine intake. Excessively cooked foods should be avoided. Vegetables should rarely be cooked over twenty minutes, and always served with the fluid in which they are cooked, to conserve the valuable vitamine containing substances as well as those inorganic salts soluble in the liquor. Disproportionate amounts of carbohydrate foods should be guarded against unless balanced by the presence of a sufficient quantity of other fresh foods. Maternal regulations are especially important in cases of breast fed babies where evidence of metabolic deficiency show themselves; in short, either a correct diet for the mother or else some form of vitamine, perhaps in the form of autolyzed yeast, may be directly administered to the nursling. In the case of artificially fed infants the early addition of vitamine containing substances and a very decided decrease of the amount of highly-milled overcooked starchy foods is to be recommended. The important vitamine of orange juice should never be neglected, even at one month, as a prophylactic against scurvy and perhaps even against rickets. Egg yolk, coddled, in gradually increasing doses beginning as early as the sixth month, if necessary, is an important vitamine containing substance often omitted on account of a possible anaphylaxis which some children have against egg albumin. There is no recorded case of anaphylaxis against egg yolk as far as the writer has been able to find out, either in his own experience or in that of others. If infants refuse the yolk pure, it may be combined with a cereal and no difficulty will arise especially if we begin with a small amount. Large amounts of cereals should not be administered unless egg yolk or vegetable juices lightly cooked are administered at the same time. Beginning with the eighth or ninth month, to maintain a metabolic balance and to prevent a condition of which under-development as an example of rachitis is typical, the child should receive mixed purees of various vegetables properly blended with the addition of sufficient carbohydrate and fat to make a "balanced ration".

As a result of careful investigation as to the diet of mothers who have rachitic children, and especially those who have had other children who have had some form of deficiency disease, and furthermore, as to the diet of women during pregnancy, or during lactation, Stark, of New York, has come to the opinion that the tendency toward deficiency disease if not the disease itself, is inculcated " in utero". The negro and Italian in this country give us all the evidence necessary to give this theory a very sound basis to rest upon. We need not here go into the dietary of the negro and Italian; its peculiarities especially as to excessive carbohydrate constituents and excessive stewing with lack of fresh foods are familiar to any one caring to make a study of a series of these mothers and their babies. The varied results obtained in some of our larger foundling institutions and nurseries and even one's private experience with feeding formulæ find an explanation in this predisposition to deficiency disease on the part of some infants. One child will thrive beautifully on a diet which would give another rickets. Another child will gain half a pound a week on what apparently starves another of the same age. In the former, the child's economy is well within the safety zone of metabolic stability, as a result of a properly proportioned diet of the mother during pregnancy, and so furnishes enough vitamine from the full supply with which it was born to counterbalance an excess of carbohydrates in his formula, and his tissues grow and perform their functions. In the latter, the child has an unstable metabolic balance, owing to the improper selection of the maternal diet and therefore cannot supply the necessary vitamine from its own economy, since it has none to spare; the metabolism is upset, a negative balance of the inorganic salts results, valuable food constituents are not retained by the tissues, the child either develops a deficiency disease, oı simply fails, and the more we "strengthen" its formula by adding carbohydrates (even if the other constituents are also added) we simply make things worse. The solution lies in adding a vitamine-containing substance.

This brings us to the next important consideration. In the absence of ideal conditions whereby sufficient active vitamine can be obtained from properly prepared fresh vegetables, eggs and the like, it remains for us to obtain a substance rich in active vitamine and at the same time stable and constant in efficiency.

In reviewing the literature on the use of yeast as a therapeutic measure we are led back to the very dawn of medical history. Schaumann was the first to show that brewer's yeast displays what was then called "antineuritic properties" for pigeons and other fowls fed on polished rice. He noted that this yeast was far richer in these properties than were other substances which he had investigated. Funk was able to show that the substance in question is of simple chemical nature since hydrolysis with acids strong enough to break down all the complex substances known in the nature resulted in the isolation of an active substance which he called "vitamine". Chamberlain, Vedder and Williams, and also Voegtlin and Towles went even a step further and ascertained that the hydrolysis yielded a more active preparation than a simple extraction of the yeast. Finally Cooper by leaving pressed yeast in an incubator for about thirty hours at body temperature obtained an hydrolysis by means of the inherent ferment present in the yeast cell similar to that produced otherwise by an extraneous acid as Funk had done. This constitutes what is known as the sutolysis of yeast and the resulting product is known as autolyzed yeast. Owing to the enormously active metabolism of the yeast plant itself it contains perhaps the greatest amount of active vitamine per bulk of substance of any product thus far known. When filtered, the filtrate may be standardized as to vitamine content and, therefore, dosage by noting the average time it takes to cure a number of beri-beri pigeons when 0·10 c.c. is injected subcutaneously, as compared with the known time required by a standard vitamine preparation to produce the same result. We have, therefore, a standardized substance which, to be sure, has not been definitely determined upon as to maximum and minimum dosage, but which should possess special advantages for the pediatrist, not only in the care of his cases of deficiency diseases, especially rachitis, since that is not so common, but always in his management of stubborn feeding cases. With these facts in mind it might seem desirable at the present stage of our knowledge to administer this substance in selected cases in much the same way as we do fruit juices, that is to say, as a prophylactic against deficiency diseases in our difficult infant feeding cases, instead of jumping about and modifying formulæ with no other hope than that "perhaps we might strike it right". The multiplicity of feeding systems now in vogue and changing with every man's opinion leaves us no doubt that the element of chance and the kindness of Mother Nature are two forces which make infant feeding an "art" rather than a "science", at least until we are willing to accept other substances than proteids, fats, carbohydrates and inorganic salts as essential to success along these lines. With the acceptance of the foregoing as a basis for further research and observation there seems little reason to doubt that a great step will have been made toward the better understanding of some difficult problems of infant feeding and also lead to a greater opportunity for the study of the principles which underlie the various deficiency diseases.

Dr. Arthur C. Nash, of Vancouver, has been appointed resident physician and medical health officer at Masset, Queen Charlotte Islands.

Case Reports

CASE REPORTS OF KIDNEY SPECIMENS PRESENTED BEFORE THE MONTREAL MEDICO-CHIRURGICAL SOCIETY, MARCH 30th, 1917

By Dr. D. W. MacKenzie

Royal Victoria Hospital, Montreal

THE first two specimens were congenital abnormalities from the autopsy room; the remainder from the operating room of the hospital (four of hydronephrosis and three tuberculous kidneys).

1. From a man, aged forty-two years, who had died of typhoid.

On the right side was a good-sized kidney above with a very small accessory kidney just below it, each having its own separate pelvis and ureter. Both ureters entered the bladder by two separate openings about ½ cm. apart.

On the left side was an irregular bi-lobed degenerated kidney showing some fat displacement. It has two pelves, one from each extremity, and two separate ureters which join 4 cm. from the entrance to the bladder.

2. From a boy, fourteen years of age, who died of uræmia. The right kidney showed dystopia and hydronephrosis with pelvis irregularly attached and a short dilated ureter.

On the left side, placed much higher, was a small rudimentary kidney with distinct ureter extending down to the bladder. The left renal artery originated just about the iliac axis, the right left the aorta just at the iliac bifurcation.

3. A. P., aged sixteen, admitted December 28th, 1916, complaining of pain and swelling in the left loin. Condition began five years ago with an attack of pain (colic) in the left loin. In August, 1914, an exploratory nephrotomy was done.

Urine: Amber, slightly hazy, acid, 1021, faint trace albumin, sugar negative; pus, microscopically +.

Phthalin, 1 c.c. intramuscularly*:* Appearance time, eighteen minutes; first hour, 35 per cent., second hour, 12 per cent.

Cystoscopy: Right ureteral opening normal. Left œdematous and inflamed; catheter entered 4 cm., but no farther; no specimen through catheter, but scratch on wax-tipped catheter.

Findings—	Right	Left.
Macroscopically	Clear straw	No specimen.
Volume	2 c.c.	
Urea	2·2 per cent.	
Microscopically	No pus.	
Phthalin—1 c.c. intravenously—		
Appearance time	2 minutes.	
Amount in ten minutes.	12 per cent.	
In bladder at close—	Trace.	

Operative findings: Impacted calculi in ureter with infected hydronephrosis and perinephritic abscess.

4. O. P., aged fifty, admitted January 13th, 1917, discharged February 12th. Complaints were pain and tumour in the right side of the abdomen, which had begun eight years previously with sharp pain in the right loin. Urine is a dirty white and almost thick; general condition bad; emergency operation performed. The *x*-rays showed several shadows as low as the brim of the true pelvis.

Operative findings: A very large pyonephritic kidney with calculi.

5. T. D., aged twenty-two, admitted January 24th, discharged February 21st, 1917. Complaints, urethral discharge. This had begun in August, 1915, with indefinite pain in the left lumbar region, of short duration; several attacks since. Two weeks ago had an attack accompanied by hæmaturia and the Sunday before admission a mild attack of pain accompanied by urethral discharge. Thinks he had fever at times.

Urethral smear (methylene blue), showed many intracellular and extracellular cocci.

Culture from urethral discharge shows micrococcus urea, urethral diphtheroids, staphylococcus albus and bacillus coli.

Urine: Amber, with mucous shreds, 1017, alkaline; albumin and sugar negative; pus ++.

Phthalin: Appearance time, thirty minutes; first hour, 37 per cent.; second hour, 10 per cent.

Cystoscopy: Showed stricture of anterior urethra; both ureters easily catheterized; hydronephrosis of left side.

Findings—	Right	Left.
Macroscopically	Deep straw.	Pale, cloudy.
Volume	2 c.c.	14 c.c.
Urea	3 per cent.	Trace.
Microscopically	No pus.	Much pus.
Phthalin intravenously—		
Appearance time	2½ minutes.	11 minutes.
Amount in ten minutes	14 per cent.	Trace.
In bladder at close—	None.	

Thorium pyelography: Dilated, irregular, pelvis.

Operative findings: Large pyonephritic kidney with stricture of left ureter near pelvis of kidney. Section of stricture showed no scar tissue.

6. C. P., aged fifty-one, admitted March 12th, discharged March 26th, 1917. Complaints were frequent and painful urination, which began with three or four days of hæmaturia, thirty years ago, at the age of twenty-one. Well for several years, then a mild attack at thirty-five. Operation for hæmorrhoids seven weeks ago, since then bladder symptoms more marked. Marked tenderness to pressure in right costo-lumbar angle.

Urine: Cloudy, straw-coloured, acid, 1018, albumin slight trace, no sugar; microscopically, epithelial cells with pus.

X-rays show shadow in right loin.

Cystoscopy: Bladder much inflamed; ureteral openings easily catheterized; left shows normal output, right, milk-like pus.

Operative findings: Large adherent calculus in pelvis with pyonephrosis.

7. P. M., aged fifty-one, admitted February 5th, 1917, discharged March 18th. Complaints were frequent painful urination for four years. Suprapubic cystotomy three years ago for tumour (?) of bladder.

Urine: Cloudy, dark, acid-pus ++++.

Phthalin: Appearance time, eleven minutes; first hour, 45 per cent., second hour, thirty per cent.

Cystoscopy: Instrument easily introduced; bladder much inflamed and contracted, no evidence of tumour. Left ureteral orifice large with thick pus emerging, right normal; both catheterized. The right showed urine clear, amber, volume 2 c.c., 2 per cent. urea, and microscopically no pus. Urine from left, 10 c.c., whitish, thick, a trace of urea and microscopically pus in large amount.

X-ray: Left kidney pelvis injected with argyrol, showed large irregular cavity.

Operative findings: Advanced tuberculosis of kidney with mixed infection.

8. D. McN., aged thirty-nine, admitted January 24th, 1917, discharged February 20th. Complaints were pain in bladder with frequent urination. Began three years ago with aching pain in bladder.

Urine: Cloudy, amber, with shreds; acid, 1015; albumin, slight cloud; sugar negative. Microscopically, epithelial cells, many red blood cells and pus in large amount. Tubercle bacilli present.

Phthalin: Appearance time, fifteen minutes; first hour, 35 per cent., second hour, 22 per cent.

X-ray: Shows irregular shadows in region of left kidney.

Cystoscopy: Instrument easily introduced; mucous membrane of bladder much inflamed with ulceration at left side. Left ureteral orifice patent, could only persuade catheter to go 2 c.m. into left ureter; right easily to kidney. No specimen from left kidney. From right urine clear, straw-coloured, 1·6 per cent. urea, few with cells.

Indigo-carmine: 10 c.c. intravenously, appearance time on right side three minutes. Did not appear on left. Amount in ten minutes on right, good output. No indigo-carmine in bladder at close.

Operative findings: Small destroyed kidney, with calcareous deposits, advanced tuberculosis.

9. F. L., aged twenty, admitted January 14th, 1917, discharged February 10th. Pulse on admission, 124. Complaints were, hæmaturia for three days. First attack May, 1916; no history of injury; another attack in July; no history of colic. Present attack began three days ago, many clots passed; severe pain in bladder. No phthalin test as urine was bloody.

X-ray: Bladder filled with blood.

Cystoscopy: With difficulty bladder was partly emptied of clots. Mucous membrane fairly normal. The right ureter was catheterized to pelvis of kidney, the left was œdematous with small clot which could not be displaced.

No specimen from left kidney. Urine from right was clear, straw-coloured, 1·8 per cent. urea and, microscopically, showed epithelial cells.

Phthalin, 1 c.c. intravenously. Appearance time, four minutes; amount in ten minutes, 12 per cent. on right.

Operative findings: Advanced tuberculosis of left kidney and ureter.

THE Metropolitan Life Insurance Company has recently completed a study of suicide as a cause of death among its industrial policyholders. The figures show that there has been a marked decrease in the number of suicides during the past few years, and that suicide is more than twice as frequent as a cause of death in males than in females. The most usual form of suicide in the case of males is by firearms, and in the case of females by poisoning. The number of suicides among negro males is a little more than half of those among white males.

Editorial

AN ANTITOXIN FOR GAS GANGRENE

IN the surgery of the present war there is perhaps no condition more terrible or tragic than that of gas gangrene. It is true that many cases have been saved by amputation, and even when the infection is not apparently virulent, by excision of the affected muscle or muscles, but such cures are rare when the infection is virulent, and are attained at great expense to the limb. Those who have worked much in France confess regularly that they have a horror of gas gangrene. It is likely that more men have died from gas gangrene in this war than from any other infection.

This being so, our interest must be particularly aroused by any work which gives promise of bringing an antidote to the poison of the Welch bacillus. An article by Carroll G. Bull and Ida W. Pritchett, which was published in the July number of the *Journal of Experimental Medicine*, appears to give this promise. Working with five strains of the Welch bacillus of which four were obtained from cases in France isolated by Dr. Simonds, and using chiefly pigeons, though also guinea pigs and rabbits, they were able to arrive at certain conclusions concerning the nature of the gas bacillus toxæmia, and, what is still more important, were able to make a protective serum.

The conclusions to which they came were briefly as follows: The infectious process is local in character, for few or no bacilli enter or are found in the general blood stream during life. The fluid culture (glucose broth) injected intravenously causes rapid death with great hæmolysis. If injected subcutaneously, or intramuscularly it causes inflaming and necrosing lesions. This is also true of the filtrate, although filtering lessens virulence. The lesions produced in the breast muscles of the pigeon, by injection of the filtrate, closely resemble those caused by infection with the bacilli.

Successive injections of carefully graded doses of this toxic filtrate in pigeons and rabbits give rise to active immunity. The blood taken from the immunized rabbits is capable of neutralizing the toxic filtrate *in vivo* and *in vitro*. The filtrate has, therefore, been designated as toxin and the immune serum as antitoxin.

The antitoxin neutralizes the toxin in multiple proportions. Hence the latter would seem to possess the properties of an exotoxin. Moreover, it neutralizes the hæmolytic as well as the locally injurious toxic constituent.

Such is the resumé of the article in the *Journal of Experimental Medicine*, but we now, in addition, have all the authority of a press clipping for the statement that the Rockefeller Institute is rapidly making this antitoxin, using large numbers of horses, and that "within three months the allied armies will be supplied with the serum". The newspaper correspondent has apparently access to more information than ourselves, still, we will not quarrel with that if only the serum proves effective under the conditions of the present war. It will, however, pretty certainly turn out that the extremely bad cases, so many of which come into our clearing hospitals, and even our base hospitals, after having lain out for twenty-four hours or longer, will not be saved by any serum. There will remain, on the other hand, many cases of mild or moderate grade in which the serum may very possibly have time to exert a good effect.

Instead of the annual meeting which was to have been held at New Orleans, in December, a War Meeting will be held by the American Public Health Association, at Washington, D.C., on October 17th to 20th. Papers and conferences will be devoted largely to problems created by the war, such as the food supply, communicable diseases among soldiers, war and venereal disease, war and the health of the civilian population.

WE publish in this issue an interesting article by Dr. Alan Brown, in which attention is directed to the important part played by vitamines in nutrition. The matter is perhaps of particular interest at this time when it is essential that every effort should be made to conserve our food supply and to use it to best advantage. The use of pure white, highly bolted flour, so much in favour on account of the whiteness of the bread it produces, is wasteful for two reasons: (a) because it lacks the nutritive qualities of the whole wheat flour, since during the process of manufacture the outer coverings of the wheat, which contain valuable mineral matter, and the germ of the wheat, which is rich in vitamines, have been discarded; and (b) whereas one hundred pounds of good average wheat will produce about ninety-nine pounds of whole wheat flour, the same quantity will produce only from sixty-five to seventy pounds of the finer white flour. This means that from four to eight million bushels of wheat could be saved in a year in this country alone were the whole wheat flour generally used. In discussing this question recently, Dr. Hastings, the medical officer of health of Toronto, drew attention also to the quantities of grain used in the manufacture of malt and spirits during the past year. He gave the following figures: *Employed in distilling*, 7,969,335 pounds of malt; 69,447,487 pounds of corn; 10,430,817 pounds of rye; 131,580 pounds of oats; 27,782 pounds of wheat; 27,416,716 pounds of molasses. *Employed in brewing*, 98,522,300 pounds of grain used for malting; 616,396 pounds of sugar and rice. Dr. Hastings stated that at the present time there are 20,000,000 gallons of spirits intended to be used for beverage purposes in bonded warehouses in this country. The use of wheat in the distillation of alcohol, unless intended for manufacturing or munitions purposes, of course is forbidden by the recent order-in-council.

THE following resolution was passed at a joint meeting of the Edmonton Medical Academy and the Dental Association which took place at Edmonton, on June 27th last: "That in the opinion of this meeting of members of the Academy of Medicine and of the Edmonton Dental Society, assembled to discuss matters of public health, we deem the matter of the public health of the province of such importance that immediate steps should be taken to place the matter before every organization of influence in the province with the view of bringing such influence to bear upon the provincial government as will bring about the establishment of a Department of Public Health, believing as we do that only by the establishment of such a department can the urgent questions requiring attention be properly and adequately dealt with."

An educational committee has been appointed by these two bodies to organize a campaign of social reform. The committee is of the opinion that a good workable social or public insurance scheme would prove of invaluable assistance in reducing the number of cases requiring provincial or charitable assistance, and recommends that the same be put into operation at the earliest possible moment. It is also recommended by this committee that, as the only way in which the many urgent and pressing questions bearing on the public health can be dealt with properly and adequately, a department of public health be established which shall be under the direction of a competent deputy minister:

(a) To coöperate with the department of education in arranging the curriculum of schools to include more hygiene, and generally to carry out a more vigorous educational policy in regard to matters of public health;

(b) To arrange inspection of all school children by competent inspectors, and in cases where the parent has not the necessary funds to pay for professional care, and provide that the same be done at the expense of the municipality in which the parent or guardian resides;

(c) For the coördination, systematizing and supervising of all work done by health officers in the various municipalities, including such work as is being done by the provincial board of health;

(d) To supervise the construction and maintenance of all hospitals, construction and maintenance to be done at the expense of municipalities;

(e) To supervise the construction and maintenance of all institutions for the care of those who for any reason have become a charge on or danger to the state;

(f) To supervise the care of all children under school age requiring assistance, including the employment of supervising nurses. "More children under five years of age have died within the British Empire since the war began than there have been men killed in the war";

(g) To grant marriage licenses;

(h) For the improvement of methods for dealing with tuberculosis and diseases largely connected with and contracted through vice;

(i) To arrange inspection of all public eating and rooming houses and to see that they are conducted with due hygienic precaution.

THE following is taken from the *Health Bulletin* issued by the Toronto Department of Public Health:

The attention of the Department of Health has been directed by the United States government to the fact that a variety of bean known as the Burmah White, or Rangoon bean, and labouring under the scientific name of "Phaseolus lunatus", has been sold in large quantities in the United States and Canada. This bean has been planted by the acre, and in no case has it come up. Furthermore it is poisonous. Analysis of samples taken in Toronto and analyzed in our laboratory show it to contain ·028 per cent. prussic acid, and cases are on record, in Holland for example, where people have died from eating it.

The Rangoon bean is a small, yellowish bean, with marked lines radiating from the small eye on the concave surface. These radiating lines and its yellow colour serve to distinguish it from the small white bean. Its importation has been recently stopped by the government as an injurious article of food.

We understand that this variety of bean has not been used by canners to be made into pork and beans, so that there would be no danger to fear from that source.

We are able to confirm the announcement that, as the the result of representations made by the Spanish government in Berlin, London, and Paris, the German government has agreed to a safe passage for hospital ships, on condition that a Spanish naval officer is on board and guarantees that the vessel is used only for the transport of sick and wounded. The French and British governments have agreed to the arrangement, and eleven Spanish naval officers, who will be posted to hospital ships under the agreement, left Madrid for the French ports about a week ago. The guarantee to be given by the Spanish officers will not involve any departure from the invariable practice of British hospital ships, although the German government has characteristically professed to believe the contrary.—*British Medical Journal.*

It is understood that Sir Alfred Keogh has in contemplation the establishment, in the office of the director-general of medical services in England, of a branch to deal with questions directly affecting territorial and temporary medical officers.

Such an arrangement would make it possible to collect and collate information upon the many problems that have arisen in connexion with the incorporation of numbers of civilian practitioners in the Army Medical Service, and to advise on the selection of officers for particular types of work for which they may be specially qualified.

Much difficulty has been experienced in regard to unexpired leases by physicians who have enlisted for active service. The lessor in many cases refusing to cancel the lease, the patriotic physician has found himself burdened with the rent of premises for which he has no use, since his business ceases automatically when he leaves, and an expense which he is frequently unable to sustain. As medical officers are needed so badly, every effort should be made to relieve them of obligations which might make it impossible for them to offer their services to their country. The Chicago Rotary Club, therefore, has taken up the matter and is desirous of obtaining definite information of cases in which landlords have refused to cancel leases held by physicians who wished to enlist. Such information should be sent to Mr. R. R. Denny, chairman of the committee entrusted with this work, care of the Dennos Food Sales Company, Chicago, Illinois.

The name of Advisory Committee on Venereal Disease for Military District No. 2, has been adopted by the committee recently appointed in Toronto to take steps to prevent the spread of such disease. A meeting of the committee took place on September 11th, when Major Fitzgerald was appointed president and Captain Gordon Bates the secretary.

Canadian Medical Association

THE MONTREAL MEETING

In the last number of the JOURNAL we published a number of resolutions which were adopted at the June meeting of the Association. There still remain some others of importance which we are publishing herewith.

1. Moved by Dr. D. J. Gibb Wishart, seconded by Dr. R. E. McKechnie, and unanimously resolved,

That in the opinion of this meeting it is advisable that the whole medical profession in Canada be conscripted and be made available for the service of their country according to their various abilities in such work as may be deemed the most necessary; those who are fit and can be spared to be sent overseas; and those who are not fit, or are unsuitable, to be allotted such work as may be deemed in the best interest of their country.

It was further resolved that a copy of this resolution be forwarded to the Premier of Canada.

2. Moved by Dr. R. E. McKechnie, seconded by Dr. E. A. Braithwaite, and resolved that,

Whereas it has come to the knowledge of the Canadian Medical Association that the Victorian Order of Nurses is considering the project of the introduction of British midwives into Canada. Be it resolved that this Association protests against such action as being ill-advised and unnecessary. Not only can the situation—which is not very pressing—be better met by establishing small cottage hospitals under the charge of regular graduate nurses, but a grave injustice would be done to hundreds of our graduate nurses now at the front, who on their return to Canada would find many fields of usefulness occupied by a much less competent body of nurses.

Be it further resolved that a copy of this resolution be sent to the chief official of the Victorian Order at Ottawa.

3. Moved by Dr. R. E. McKechnie, seconded by Dr. D. Smith, and resolved that,

Whereas grain alcohol has long been extensively used in hospitals for various accessory external purposes, and

Whereas since the war its increased cost has resulted in the substitution of wood alcohol for the same purposes, and

Whereas it is proved that wood alcohol is a very violent poison, not only when ingested but also by inhalation and through the external surface, and

Whereas the increased cost of grain alcohol is in the main a matter entirely controlled by the government, therefore be it resolved,

That the Dominion government be requested to make special reductions in the duties on grain alcohol used exclusively for hospital purposes, so that institutions working solely for the public good may not be unduly burdened.

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4. Moved by Dr. Helen MacMurchy, seconded by Dr. Campbell Meyers, and resolved,

That inasmuch as proper provision for the suitable training and permanent care of mentally defective persons is urgently needed, not only in the best interests of such persons and their families, but for the national welfare, the section of Medicine would therefore request the Executive Council to take whatever action they may deem advisable in this matter, such as appointing a special committee to report upon this subject at the next annual meeting of the Canadian Medical Association.

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5. Moved by Dr. Bryce, seconded by Dr. Beaudry, and resolved,

That in view of the urgent requirements of public health, it is the opinion of the section on Public Health of the Canadian Medical Association that it is essential that the "Municipal Health Unit of Organization" be enlarged so that there may be appointed in the several provinces, all-time medical officers of health qualified in public health duties, who shall devote all their energies and time to the health interests of their communities.

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6. In connexion with a paper by Dr. G. G. Copeland, of

Toronto, on Blindness in the Newborn, the following resolution was unanimously passed by the section of Obstetrics and Gynæcology.

Whereas it has been proven that a very large percentage of cases of blindness is due to infection acquired at birth, and whereas, at least 98 per cent. of such infections can be inhibited at their outset by simple means, it is hereby resolved, that the members of the section of Obstetrics and Gynæcology of the Canadian Medical Association, now in session, request the Executive Committee to take such active steps as may tend to suppress this crying evil in the community, and beg to suggest that an influential committee be appointed to consider the whole question, and that such committee be empowered to approach the Federal and Provincial authorities with a view to the introduction of suitable prophylactic legislation.

Financial Statement for 1916

For the information of our members the auditors' report for the financial year ending December 31st, 1916, is here published. Comparison with last year's report will show considerable improvement in the financial condition of the Association. The cash surplus at the end of 1915 was only $32.82, whereas at the end of 1916 our statement shows a surplus of $719.84. From this, however, should be deducted the sum of $220,00, the amount of the refund due the Ontario Medical Association in 1916, and which should have been paid before the end of that year. The total surplus at the end of last year was therefore $499.84.

It will be further noted that there is a decrease in the total amount of subscriptions collected, this, of course, being accounted for largely by the number of our members who have gone overseas. In connexion with the decrease in subscriptions we should inform our members that the Executive Council at a special meeting held during 1916, decided that for members who are on active service overseas the subscription fee should be reduced to $2.00.

Auditors' Statement

The Chairman of Finance Committee,
Canadian Medical Association,
Montreal.

Dear Sir,—

We beg to report that we have completed an audit of the

Association's books and accounts for the year ending 31st December, 1916.

The attached statement shows cash receipts and disbursements for the period.

A surplus of $719.84 is carried forward as compared with $32.82 for the year 1915.

Subscriptions due for 1916, which have been collected since the closing of the books, amount to $81.00.

We found the books in excellent order. Your cash account has been reconciled with the bank book and proper receipts and vouchers were on hand for all disbursements. Our requirements as auditors have been fully satisfied.

Yours faithfully,

E. B. SAVAGE & CO.

Montreal, 3rd May, 1917.

CASH RECEIPTS AND DISBURSEMENTS, YEAR ENDING DECEMBER 31ST, 1916

Receipts

Balance in Bank January 1st, 1916		$32.82
Annual fees paid direct	$1,263.63	
Annual fees paid by draft	3,772.05	
Annual fees paid at Ontario Medical Association	409.60	
		5,445.28
Reprints		328.85
Bank rebates		.90
		$5,807.85

Disbursements

Editorial secretary's salary		$600.00
Refunds paid Provincial Societies—		
New Brunswick	$45.50	
Alberta	44.50	
Nova Scotia	42.50	
Saskatchewan	27.00	
Manitoba	58.00	
British Columbia	33.00	
		250.50
JOURNAL Account—		
Renewal subscriptions	$2,178.00	
New subscriptions	288.00	
Sundries	41.93	
		2,507.93
Reprints (Murray Printing Co.)		332.33
Clippings		48.00
Montreal Medical Journal Co.		
Payment to stockholders, $5,000 at 6 per cent.		300.00

General Expenses—		
Salary, stenographer	$730.00	
Postage and sundries	120.00	
Stationary	89.90	
Travelling expenses: Toronto	56.60	
Audit fees	20.00	
Sundries	32.75	
		$1,049.25
Balance in bank		719.84
		$5,807.85

Certified correct,

E. B. Savage & Co.,
Chartered Accountants.

Montreal, May 3rd, 1917.

Correspondence

Toronto, August 21st, 1917

The Editor,
The Canadian Medical Association.
Sir,—

I note with satisfaction your article in the current number of the Journal upon the Venereal Disease problem, particularly that portion in which you deal with the matter of the production of remedies for the cure of syphilis, with free diagnosis and treatment, and with quack practice and advertising of quack remedies.

You will be interested in knowing that the Provincial Board of Health made application last June to the Commissioner of Patents for a license to prepare a substitute for salvarsan, under the German patents. This application was most vigorously, and for the time being, successfully opposed by the Synthetic Drug Company, and Dr. Archambault, of Montreal, the present licensees. Although it was shown to the Commissioner that the facilities of the Board in the way of plant, etc., would obviously reduce the present excessive retail price ($2.50 per 0·6 gramme, which is 100 per cent. above the wholesale price), the application was refused. However, a strong protest is being entered against this decision and the Board relies upon the medical press and profession for support in securing in respect to these remedies, the same successful results which have been attained in regard to the various vaccines and antitoxins now supplied free by the Board and made available at about cost price to the whole of Canada.

The Synthetic Drug Company, while disclaiming that they control the retail price of diarsenol, can scarcely successfully maintain such denial in the face of the fact that, when one seeks to purchase this article one is confronted by the printed card of the company detailing the retail price already referred to.

I might mention, with reference to the Academy resolutions, that the Board has already in operation a strong propaganda of education and that laboratories for the free diagnosis of venereal diseases are now in operation at Kingston, London and Toronto. The question of free treatment will have to wait until we can obtain a cheaper means of treatment.

Legislation should certainly be secured to control quack practice and advertising.

The Board is fully alive to the need of vigorous action in respect to this problem and is prepared to advance as rapidly as public opinion will support it.

I have the honour to be, Sir,

Your obedient servant,

J. W. S. McCullough,

Chief Officer of Health.

Book Reviews

Experimental Pharmacology. By Dennis E. Jackson, Ph.D., M.D., associate professor of pharmacology, Washington University Medical School, St. Louis, with 390 original illustrations, including twenty-four full page colour plates. St. Louis, C. V. Mosby Company, 1917.

This is a very excellent manual which should be in the hands of every student of experimental pharmacology—and we may add of experimental physiology. The text is excellent, giving exact specific and detailed directions for carrying out almost all the experiments which the student will be called upon to perform in the study of this very important subject. The book itself with its excellent paper, beautiful type, and wealth of illustration, reflects the highest credit upon its publishers. We strongly recommend it to all our students.

HANDBOOK OF SUGGESTIVE THERAPEUTICS, APPLIED HYPNOTISM, PSYCHIC SCIENCE. A manual of practical psychotherapy, designed especially for the practitioner of medicine, surgery and dentistry, by HENRY S. MUNRO, M.D., Fourth edition, revised and enlarged. St. Louis, C. V. Mosby Company, 1917.

This book, now in its fourth edition, has been written to emphasize the value of suggestive therapeutics to the general practitioner, and embodies what the author has found to be useful in his own practice after a careful study of what has been written on the subject, and after many years of practical experience. Of the value of psychotherapy the writer is confident. In this volume he has endeavoured to place the basic principles of physiological psychology before the profession in such a manner as to be easily grasped and assimilated; by presenting the scientific as well as the practical side of psychotherapy to his readers. Quoting a remark made by Professor Barker of Johns Hopkins Hospital, "Modern medicine is striving towards rational psychic diagnosis and rational psychotherapy," he claims that in many affections an inquiry into the psychic state of our patient is more important than the actual somatic inquiry. He considers that in all classes of disease psychotherapy finds an important field of application as by its means we can make a direct impression upon the brain and through it increase the functional activity of every cell in the human body. Among the more important chapters in the book are those on—Scientific basis of psychotherapy; practical theoretical considerations; pyschotherapeutic value of suggestion; psychotherapy in obstetrics; pyschoanalysis in the treatment of the psychoneuroses.

The book is written in a pleasant style which makes it easy reading. While we hesitate to accept every statement of the author, who is an enthusiast, we recognize the book as eminently practical and well worthy the perusal of every physician who desires to make use of this valuable therapeutic adjunct.

THE DISEASES OF INFANCY AND CHILDHOOD. For the use of students and practitioners of medicine. By L. EMMETT HOLT, M.D., Sc.D., LL.D., professor of diseases of children in the College of Physicians and Surgeons (Columbia University), New York; and JOHN HOWLAND, A.M., M.D., professor of pediatrics in the Johns Hopkins University, Baltimore. Seventh edition, fully revised. 1,161 pages with 215 illustrations. Publishers: D. Appleton & Company, New York and London, 1916. Price, $6.00.

Dr. Holt's treatise on diseases of infancy and childhood has been for the past twenty years regarded as our leading text-book on this subject; we may almost add as the leading text-book in the English language. Five years have elapsed since the last revision. Since then he has joined with himself as co-editor, Dr. John Howland, pediatrist-in-chief to the Johns Hopkins Hospital. The present revision has been a very thorough one and owing to the high standing of both the editors the volume will maintain its high place among the many text-books on this subject. Few medical text-books are so pleasantly written and few present their facts in such a lucid manner as this, and are at the same time so eminently practical. In this edition we have read with much interest and profit the new chapters on acidosis, neuropathic and exudative diathesis; idiosyncrasies to foodstuffs; cardiac arrhythmia; Banti's disease; pellagra; and syphilis of the nervous system. Many chapters have been entirely re-written, of which the more important are those on digestion in infancy; asthma; accidental heart murmurs; poliomyelitis; diseases of ductless glands, and diabetes. Many new illustrations have been added. To the student and to the physician in practice we have much confidence and pleasure in strongly recommending this last edition of Holt's text-book as one of the ablest presentations of the diseases of infancy and childhood at present before the public.

Obituary

GEORGE RAYMOND McDONAGH, M.D.

THE death of Dr. McDonagh occurred at Toronto, on August 26th, in the sixty-second year of his age. Born in 1856, at Carlow, in the province of Ontario, George Raymond McDonagh was educated at the Goderich Grammar School, and at Upper Canada College, from which he went to Toronto University, where he graduated in medicine, in 1876, at the early age of twenty-one. Dr. McDonagh went into practice at Brussels, in partnership with Dr. Graham for a time, and then went to London and Edinburgh to do post-graduate work. Upon his return to Canada he went into practice at Goderich, but a couple of years later returned to Europe and went to Vienna, where he made a special study of diseases of the ear, nose, and throat, to which he subsequently devoted himself. Since his return he had practised in Toronto. He was appointed professor of oto-laryngology in the University of Toronto in 1903. Dr. McDonagh was particularly fond of travel and for the last ten years had been in the habit of spending his winters abroad. He was unmarried.

DR. JEROME J. MURPHY, of Wawota, Saskatchewan, died at the Moosomin General Hospital, on August 26th, after a short illness. Dr. Murphy was a graduate of Edinburgh University, of the year 1896, and had been in practice in Saskatchewan for about six years.

News

MARITIME PROVINCES

IT is the intention to increase the accommodation of the Camp Hill Military Hospital at Halifax, by the addition of two new wings. It will then have a capacity of 600 beds. A separate building has been provided for vocational training.

ONTARIO

The new wing that has been added to the Weston Sanatorium and the William Davies Cottage for Babies were formally opened by His Excellency the Duke of Devonshire on August 29th last. It was announced on this occasion by Mr. McPherson that it was the intention of the government to establish a six hundred bed sanatorium for soldiers suffering from tuberculosis within a few months and that the institution, when no longer required for the use of military patients, would be used for the treatment of consumptive patients from the hospitals for the insane and similar institutions in the province.

Thirty-six cases of infantile paralysis were reported in the province during the month of August; death occurred in three of the cases. Other cases of infectious disease reported were: Tuberculosis, 174 cases, 66 deaths; smallpox, 16 cases; scarlet fever, 67 cases, 2 deaths; diphtheria, 227 cases, 17 deaths; measles, 114 cases, 1 death; whooping cough, 209 cases, 6 deaths; typhoid fever, 71 cases, 11 deaths; cerebro-spinal meningitis, 5 cases, 4 deaths.

QUEBEC

In accordance with the present by-laws and the legal opinion recently expressed by the city attorney, all building plans in the city of Montreal in future must be submitted to Dr. Boucher, the medical officer of health, as well as to the city architect.

BRITISH COLUMBIA

The formal opening of the military annex of the Vancouver General Hospital took place on September 5th. The building contains accommodation for three hundred patients, the wards, eight in number, each containing from thirty-four to forty beds.

MEDICAL COLLEGES

McGill University

The honour of a Knight Commandership of the Order of the Bath has been conferred by His Majesty the King upon Brevet Lieutenant-Colonel (temporary Brigadier-General) Auckland Campbell Geddes, C.B., M.D., director of recruiting in England, in recognition of valuable services rendered in connexion with the war. Sir A. C. Geddes had occupied the chair of anatomy in McGill University for a year when the war broke out. He at once turned to good account his knowledge of military organization and his previous experience during the South African war and at the Universities of Edinburgh and Dublin, where he had been responsible for the institution and organization of the officers' training corps, and under his able direction the McGill Battalion was formed in the early days of the war. Within a few months, however, he was recalled to England. Since then he has held many posts of responsibility and is now the director of recruiting, with the military rank of brigadier-general. Sir A. C. Geddes is the brother of Sir Eric Geddes, First Lord of the Admiralty.

ARMY MEDICAL SERVICES

THE Military Cross has been awarded to the following officers:

CAPTAIN (TEMPORARY MAJOR) RONALD HUGH MACDONALD, C.A.M.C., of Winnipeg. "For conspicuous gallantry and devotion to duty. One of our aeroplanes was shot down, the observer was wounded and pinned beneath the wreck. This officer and a bearer went out in full view of the enemy, who were shelling the machine, and extricated the wounded man and removed him to safety. He himself was severely wounded while doing so."

CAPTAIN ROBERT JAMES MANION, C.A.M.C., of Fort William. "For conspicuous gallantry and devotion to duty. While going forward through a heavy hostile barrage to establish an aid post, he, at great personal risk, stopped and dressed alone nine wounded men."

CAPTAIN ARCHIBALD MCCAUSLAND,* C.A.M.C. "For conspicuous gallantry and devotion to duty. At great personal risk he crawled through a small opening into a dug-out which had been blown in by hostile shell-fire, dressed the men there, and afterwards attended to all the wounded in the locality, under continuous heavy shell-fire. His courageous action saved the lives of several wounded men."

CAPTAIN ASHLEY COOPER JOHNSTON, C.A.M.C., of Cowley, Alberta.

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*Captain McCausland's name was published in our last issue but we have since learned the particulars given above.

Captain Frank L. McKinnon, B.A., M.D., of Winnipeg. "For conspicuous bravery shown in the carrying out of duties in connexion with the Royal Army Medical Corps."

Captain Charles Goldie Sutherland, C.A.M.C., of Albany, New York.

Captain Graham R. Ross, C.A.M.C., of Montreal.

Captain Gordon Archibald Macpherson, C.A.M.C. "For conspicuous gallantry and devotion to duty in collecting and tending the wounded under heavy shell-fire. His promptness and devotion in collecting stretcher cases in dug-outs where it was impossible to evacuate them at once undoubtedly saved many lives."

Captain Andrew Harvey Cameron Smith, C.A.M.C. "For conspicuous gallantry and devotion to duty. Following his battalion closely in its attack, he displayed the greatest courage and skill in establishing aid-posts at the nearest possible points, regardless of his own personal safety. Though his posts were frequently under heavy shell-fire, the completeness of his medical arrangements, and the quickness with which aid was available, proved invaluable to the wounded. His work at all times has been marked by the same devotion and gallantry."

Captain John Ernest Affleck, C.A.M.C. "For conspicuous gallantry and devotion to duty. He crawled along a trench to a severely wounded officer whose life depended upon an immediate operation. He got the wounded man on a blanket. It was a very slow and dangerous task, being completely exposed to snipers. Captain Affleck did not hesitate to risk his own life to do all humanly possible for this officer." When the McGill University Hospital was mobilized Captain Affleck was studying medicine at McGill. He joined the unit and accompanied it to the front, where he spent some months as an orderly. He then returned to Montreal to finish his medical studies and graduated in the spring of 1916. He was given a commission in the Canadian Army Medical Corps and after training for a few months at Valcartier, returned to France as medical officer of an infantry battalion.

Temporary Lieutenant Robert Beattie Martin, R.A.M.C. "For conspicious gallantry and devotion to duty. He showed the greatest gallantry in attending to the wounded under very heavy fire at a moment when the enemy had turned machine guns on to them. He displayed the utmost fearlessness and skill in getting most of them away into a place of safety."

The following appointments in the Canadian Army Medical Service have been gazetted:

Deputy Director of Medical Services: Temporary Colonel Murray MacLaren, C.M.G., C.A.M.C.

Assistant Director of Medical Services: Temporary Lieutenant-Colonel C. E. Doherty, C.A.M.C.

Deputy Assistant Directors of Medical Services: Temporary Major J. S. Jenkins, D.S.O., C.A.M.C., and temporary Captain H. B. Logie, C.A.M.C.

THE Royal Red Cross of the second class has been awarded by His Majesty to Nursing Sisters EMMA F. PENSE, of Kingston, Ontario, and FLORA H. WYLIE, of St. Catharines, Ontario.

THE French Cross of War has been conferred upon Nursing Sister MADELINE F. JAFFRAY, of Philadelphia, Pennsylvania.

MAJOR SAMUEL H. McCOY, C.A.M.C., of St. Catharines, Ontario, has been recommended for the D.S.O.

THE undermentioned officers of the Canadian Army Medical Corps have been brought to the notice of the Secretary of State for War for valuable services rendered in connexion with the war:

LIEUTENANT-COLONEL J. A. AMYOT.
LIEUTENANT-COLONEL G. E. ARMSTRONG.
CAPTAIN A. B. CHANDLER.
LIEUTENANT-COLONEL J. T. CLARKE.
LIEUTENANT-COLONEL W. H. DELANEY.
LIEUTENANT-COLONEL D. DONALD.
CAPTAIN W. J. ENRIGHT.
LIEUTENANT-COLONEL C. H. GILMOUR.
LIEUTENANT-COLONEL P. G. GOLDSMITH.
CAPTAIN T. F. GRAHAM.
CAPTAIN H. C. HALL.
LIEUTENANT-COLONEL J. McCOMBE.
MAJOR S. H. McCOY.
CAPTAIN W. B. MACDERMOTT.
LIEUTENANT-COLONEL H. E. MUNROE.
LIEUTENANT-COLONEL R. RAIKES.
LIEUTENANT-COLONEL H. M. ROBERTSON.
COLONEL R. D. RUDOLF.
LIEUTENANT-COLONEL C. L. STARR.
MAJOR R. E. WODEHOUSE.

Among recent promotions in the Canadian Army Medical Corps are the following: To be temporary Lieutenant-Colonels: Major C. H. Dickson and temporary Major E. L. Stone. To be acting Lieutenant-Colonel while in command of stationary hospital: Temporary Major H. E. Kendall. To be Majors: Captain J. G. Johnson and Captain R. N. Sutherland, and temporary Captains W. Creighton, E. S. Jeffrey and D. J. Cochrane. To be temporary Captains: J. W. Dickson, G. F. Laing and J. Patterson.

Major J. G. Johnson is senior surgeon and Major R. N. Sutherland is senior medical officer to No. 1 Canadian Stationary Hospital in Salonica, under the command of Lieutenant-Colonel E. J. Williams, C.A.M.C.

Captain A. P. Chown, C.A.M.C., is in charge of the Canadian Central Depot medical stores, at 12 Pulteny Street, London.

Lieutenant-Colonel David K. Smith, who has been on duty at Salonica with the Toronto University Hospital, has returned to Toronto suffering from a recurrence of malarial fever contracted in Greece.

Captain O. C. J. Withrow, C.A.M.C., of Toronto, has been appointed medical officer of the Military Hospital that has been opened at Newmarket.

Lieutenant-Colonel T. C. Bedell, C.A.M.C., is acting officer commanding the Canadian Convalescent Hospital, at Epsom, during the absence on leave of Lieutenant-Colonel Irving, C.A.M.C.

Dr. Thomas B. Futcher, associate professor of clinical medicine at Johns Hopkins Hospital, has received a commission in the Canadian Army Medical Corps and has left for England, where he will assume command of a Canadian military hospital. Dr. Thomas McCrae, who has been in command of this hospital, has returned to Philadelphia. Dr. Futcher, who like Dr. McCrae, is a Canadian by birth, graduated from the University of Toronto in 1893.

Lieutenant-Colonel George Bourgeois, C.A.M.C., is on duty at the Saint-Cloud Hospital. Lieutenant-Colonel Bourgeois left Montreal in command of the Laval Military Hospital.

Major Charles Saint Pierre, C.A.M.C., is attached to the Laval Hospital, at Troyes, France.

There are about three hundred patients now in the North Toronto Military Orthopædic Hospital. The officer in command is Lieutenant-Colonel W. E. Gallie, C.A.M.C. The hospital building was intended originally for the Salvation Army, but was taken over by the Military Hospitals Commission last October. Two wings have since been added, each providing accommodation for one hundred and fifty patients. A factory for the manufacture of artificial limbs has also been built and a vocational training building is now in process of construction.

CASUALTIES

Wounded

Captain Robert Inkerman Harris, M.C., R.A.M.C.

Captain William J. Knight, M.C., R.A.M.C., of Guelph, Ontario.

Captain James Moore, C.A.M.C., of Brooklin, Ontario, medical officer of the 116th Battalion.

Captain Oswald J. Day, M.C., R.A.M.C., of Toronto, East Surrey Regiment. Captain Day was decorated with the Military Cross in June "for conspicuous gallantry and devotion to duty."

Medical Societies

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The thirteenth regular meeting of the Society was held Friday, March 30th, 1917, Dr. W. S. Morrow, president, in the chair.

Living Case: Tuberculous râles, by Dr. E. S. Harding.

In bringing this case before the Society I would like first to touch a little on the history of the condition presented. The first case presenting these râles came to me as a private patient in 1911. There was a history of cough extending over years, which had been much worse during the previous fall and winter; no expectoration; no hæmorrhages. Typhoid at the age of fourteen. One brother died of tuberculosis. On examination over the left interscapular space I detected a rather fine expiratory râle, more in the nature of a little wheeze or sibilant râle (like the souffle sometimes heard over the left chest with the beat of the heart). This was not synchronous with the heart beat and was only expiratory. I marked it at the time as being like a pleuritic râle. There was practically nothing else in the chest to draw one's attention to a condition of tuberculosis. I saw her again in the middle of the summer when she was complaining of a great deal of pain over that region with the cough stil persisting; loss of weight, from ninety-eight to eighty-six pounds. On July 19th her condition was practically the same, except an increase of the râles spreading a little towards the base of the left lung. The scapular region here was very tender to the touch and the left interscapular space extremely sensitive. I tried both internal and external remedies and the patient spent most of that summer in the mountains with no improvement. On August 7th and September 7th examination showed the condition the same. In October I gave her a tuberculin test with about the sharpest reaction I had ever seen. The condition continuing, I put her on tuberculin which she took practically all winter once a week with marked amelioration of her symptoms, the pain subsiding a great deal. Two years ago I again saw the patient and she said she was in pretty good health but she did not want to be examined again, fearing to be told she still had tuberculosis. The râle when I last examined her was practically the same, quite as persistent, occupying the same space in the interscapular region on the left side.

The second case was a man who complained of pain in the left chest. His wife recently died from tuberculosis and becoming alarmed at the pain he consulted me. On examination I found an expiratory râle something the same as in the last case, over the left chest, about the third rib to the axilla. It was not nearly so marked but was of slightly longer duration and not so persistent. The pain was all he complained of. I gave him a tuberculin test and he reacted quite sharply. I saw him a year later and the condition was practically the same except that the pain was not quite so marked. He had no treatment and I have not seen him since.

The present case was recommended to me by Dr. Hepburn, in August, 1915. He had typhoid fever six years previously and since that time more or less persistent cough. At the time of examination he had slight morning cough with expectoration, slight hæmoptysis, night sweats, and distress on walking. Normal weight one hundred and sixty pounds, present weight one hundred and forty-eight pounds and a half. Examination showed slight depression of the right apex with impaired sounds on percussion and a few coarse râles outside the heart. On August 1st, I gave him a tuberculin test, which reacted to 101·1 on the third dose. On examination after that test the expiratory râles were heard in the right subclavicular region. He was put on tuberculin and allowed to continue work. During the course of tuberculin there were several reactions, one of them fairly severe. He finished his last dose in April, 1916, and his weight had returned to one hundred and sixty and a half pounds. He was still working. Examination at that time still showed the expiratory râles, otherwise was practically negative. He has been working ever since and in good health. He complains of pain over the region that was first affected, the right subclavicular region, and the peculiar part of it is that after the pain disappears the flesh on that side of the chest is sensitive. The *x*-ray plate of the present patient shows only a little extra thickening over the area involved and no marked glandular enlargement.

These three cases each showed the same wheeze or sibilant dry expiratory râle localized to one particular part of the chest, very persistent, extending over months or years. In each case there was a history of sharp pain in the locality affected, and in two of the cases the skin was sensitive. Each case reacted sharply to tuberculin. Two out of the three cases responded well to tuberculin treatment.

PATHOLOGICAL SPECIMENS: Series of kidneys, by Dr. D. W. MacKenzie.

Two specimens of congenitally abnormal kidneys, four of hydronephrosis and three of tuberculosis. These were illustrated by *x*-ray plates. A full description of these specimens, together with their clinical histories appears on page 925 of this number of the JOURNAL.

DISCUSSION: Dry F. M. Fry: Although it was not mentioned I presume that the cases of renal tuberculosis were unilateral. In children renal tuberculosis is fortunately almost always unilateral.

Dr. M. Lauterman: Dr. MacKenzie is to be congratulated on having such an interesting series of cases to bring before us, the striking thing in this series to me is the fact that these patients all had trouble for some considerable time before coming under his observation, which was probably the first time that a complete urological examination had been made in each instance. In my modest way I have been preaching and pleading for thorough examination in this department, from the floor of this Society for some years past.

In one of his cases Dr. MacKenzie referred to a stricture of the ureter as being of congenital origin. In reciting the history he spoke of the patients having had nephrolithiasis followed by infection. Would it not be more likely that the stricture followed this traumatism and infection?

A very important point referred to by Dr. MacKenzie was that of the urea output in the absence of practically any phthalein output. This is interesting from the fact that the kidney will continue to function until it is completely destroyed; unfortunately this does not assist us very much in deciding when it is safe to operate in any given case, it does, however, prove that a kidney can still eliminate urea even though it can only, so to speak, gasp. Another interesting and important point mentioned was the fact that these patients at first rarely present any distinctive or localizing symptoms, so that a complete urological examination is the only means whereby one can determine, early, whether that patient has a renal calculus, an obstructed ureter, or a tuberculous kidney.

Dr. D. W. MacKenzie: In the three tuberculous kidneys we had two with no evidence of lesion of the other side, but the third, the small contracted kidney, did show some pus coming from the other side. With regard to the phthalein output we have found that we often get a very low output when the kidney lesion is very small and very early; later it increases as the kidney begins to right itself, then diminishes when the kidney is being destroyed. With regard to the case Dr. Lauterman mentioned, we thought that was probably due to a stone in the past, but section does not show any marked inflammatory reaction and the stricture appears to be more or less of a congenital nature.

Papers: 1. Gonorrhœal urethritis, its diagnosis and treatment, by Dr. E. J. Daly.

Discussion: Dr. M. Lauterman: I am sure this paper has been exceedingly interesting to all of us, the average man is not in practise very long before he has occasion to think of one or other phase or condition developing as a result of this disease. The writer has brought out several points of very great importance during the reading of his paper; the differential diagnosis between true gonorrhœa and simple non-specific urethritis, is one the importance of which cannot be overestimated. Like many others I can look back on instances in which I took it for granted that a patient suffering from a urethral discharge had gonorrhœa, and I agree that a culture carefully made is the only certain means at our command to enable us to make a correct diagnosis.

If I may be permitted to differ on a few minor points, I should like to say that I cannot, for instance, agree that there is always a greenish-yellow discharge on the third or fourth day. I have seen cases repeatedly in which there was only the slightest moisture at the meatus, and yet intracellular gram-negative cocci were found to be present. I take exception also to the statement that the bladder is never involved. I have had at least two cases in which it was distinctly involved, one coming to post mortem in which an ascending gonorrhœal pyelitis involving the renal pelvis was present. The literature also contains reports of several similar cases.

I have not been as fortunate as Dr. Daly in the treatment of gonorrhœa epididymitis. I have followed the treatment that he suggests, but have by no means had recoveries in forty-eight hours. I have been more successful with Hanger's method, puncturing the epididymis either with a small Græffe knife or a large triangle needle and following this operation by the use of hot applications. The pain subsides in a very few hours, and recovery with a functionally useful testicle is as a rule very rapid; the drop or two of pus liberated by the puncture drains into the scrotum and is I believe absorbed. I have never seen any bad effect follow this simple operation.

Dr. Daly's remarks on the subject of stricture are very much to the point. I quite agree with him that in the great majority of instances it is possible to dilate satisfactorily. Internal urethrotomy, in my experience, is rarely necessary and external urethrotomy scarcely ever called for. Personally I much prefer the Kollman dilator to the sounds usually employed; in experienced hands its use is painless; the dilatation is effected at the point of contraction and can be gradually increased as may be necessary without changing the instrument.

I am sorry that Dr. Daly did not discuss more fully the question of when he considers a case of gonorrhœa cured. This, in my opinion, is a matter of considerable importance, not only as regards the patient himself, but also as regards his wife, either prospective or actual. The work of Schwartz and McNeill in connexion with the complement fixation test for residual gonorrhœa, has thrown considerable light on this subject.

Dr. F. R. England: I have been interested in and appreciate very much Dr. Daly's most excellent and lucid paper. He has dealt with a very important subject, for certainly gonorrhœa is one of the most important infections with which the physician and surgeon has to deal. Regarding the question of diagnosis: Ricord, the great French surgeon, said years ago, "Almost any man knows when he has the clap but God alone knows when he will get over it." The great majority of cases of urethritis are certainly due to the gonococcus of Neisser. The point which impressed me most in Dr. Daly's paper was the picture he drew of the natural history of the disease and it was from that standpoint that he studied it and based his treatment. This teaching the profession would do well to appreciate, namely, that there is, as yet, no specific remedy, no panacea, for the treatment of gonorrhœa; we must study the pathological changes which occur during the course of the disease and conduct our treatment on general surgical principles. I can add nothing further except to say that this has been my conception of the disease and its treatment for years. Regarding the treatment of strictures: in recent cases where there is narrowing of the urethra coarctation, due to round cell infiltration, dilatation with sounds or bougies is indicated. In old lesions where there is a definite organic stricture, a ridge or band of cicatricial tissue, urethrotomy is the proper surgical procedure.

2. The second paper of the evening was read by Dr. C. E. Holbrook on carcinoma of the cervix uteri, with a short series of cases. This paper appears on page 906 of this number of the JOURNAL.

CASE REPORT: Case of epilepsy in a boy of fifteen, with automatism, by Dr. A. G. Morphy.

The boy is now fifteen years and six months of age, is of English parentage, and came to the Royal Victoria Hospital one and a half years ago with epilepsy. At three months of age he began to have convulsions, the fits being irregular in time of occurence; he might have three or four in one day or none for a few days. The fits continued until he was eight years old when they ceased but began again at fourteen. The family history is quite negative, after most careful inquiry from the point of view of heredity.

The patient is a pale, stupid-looking boy, palate high and arched, tonsils and adenoids have been removed. He had a peculiar appearance about his face and ears, which it is difficult to describe. He came to the hospital first in September, 1915, having very frequent attacks, three or four in one day. On bromides he improved a bit, but later the attacks came on as frequently as ever. On looking over the reports I have found that the fits have changed in character from time to time; they are sometimes less severe and he does not fall to the ground; at other times they are very severe. The patient's memory has been gradually failing. In March, 1916, the mother reported that his memory was very poor; he could not remember where he had put anything, forgot what he had just done, *e.g.*, he would finish dinner and then ask for dinner some half hour afterwards. One day he sat in the kitchen sink and turned on the hot water; again he would take off his clothes during the day and go to bed and sleep, then wake up and ask why he was in bed. Often he would take off his boots for no purpose whatever. At the end of a month this phase left him, but his failure of memory was more marked; he began to eat excessively also. He gets 20 grs. bromides three times a day and still has fits, which means that he is a fairly severe case.

The noteworthy points are, first, the interval free from attacks, from the eighth to the fourteenth year, which bears out the statement that in two periods of life these disturbances of equilibrium are more prone to occur, from infancy to childhood, and from childhood to adolescence. The epileptic habit being established again in the second period will probably last for years or the patient's lifetime. The second point is the automatism. This lasted in, this case, for about a month, and I am unable to state why it came on or why it left. Automatic acts seem to be simply unaccountable mental derangement. Sometimes the automatic act is merely a suspension of memory, and then after the patient recovers he realizes that he does not know what has occurred in the interval, as happened in the case of our patient. A driver in London drove his horse and cart six miles across the city, and on recovering himself was quite unable to explain how he had arrived there. On the other hand an action may occur which has no apparent connexion with the patient's actions or conversations before the attack. The essential disturbance in this state is the difficulty of the patient assimilating the sensory impressions that are concerned with environments and joining them up properly with memory pictures, hence delusions and hallucinations.

Discussion: Dr. G. S. Mundie: The subject which Dr. Morphy has brought before the attention of the Society is a most interesting one, and like cancer, we have found no cure for epilepsy. These cases are most interesting from the medico-legal standpoint. As you probably will remember in the trial of Eva Boyle the question was brought up and the defence tried to prove that at the time she committed the murder she had had an epileptic fit; however, the evidence was not strong enough to prove this. One case we had of a man who during these attacks would put everything he could lay his hands on in the stove and when he came out of the fit he had no memory of having done this. Then there is the phase of what the French call *fugues*, in it the patient would suddenly, or quietly, wander off with no idea where he was going and suddenly find himself in a different part of the country or city and could not explain how he got there. This condition is not confined, however, to epilepsy and may appear in cases of tumour of the sphenoidal lobe, etc. There was the case of a soldier in one of our camps who suddenly took up a rifle and shot one or two of his companions and who had absolutely no memory of the act after. It was proved later that he was an epileptic.

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Annual Meeting, Calgary, 1917.

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Annual meeting, Ottawa, September 26th, 1917.

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Annual meeting, Ottawa, September 27th and 28th, 1917.

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Annual Meeting, 1917, Rimouski.

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The Canadian Medical Association Journal

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PRESIDENTIAL ADDRESS

ACADEMY OF MEDICINE, TORONTO

By D. J. Gibb Wishart, M.D.

I HESITATE to appear before you this evening and from this seat to address you upon subjects upon which I feel so ignorant.

This Academy which I watched through its pre-natal development and at whose birth I assisted, has become in the ten years of its existence such a healthy thriving youngster with such a capacity for earnest achievement, and withal, with a wilful temper requiring guidance and perhaps the curb, that my heart may well fail me lest I come short in making the year of my official control one of distinct progress.

The rule by which you enlist for three years the services of the individual selected for your highest office—the first year as vice-president, the second as president and the third as consultant in chief—is, to my mind, most wise for thereby he is at once trained and stimulated.

It is my pleasing duty to direct your thought first to the programme for the year's study. The programme should be annually prepared in advance with a view to definite progress in a scientific direction. It should not be arranged haphazard or capriciously.

Each eminence gained upon our path opens up vistas of land unexplored. It is given to our profession to pursue as fascinating an exploration of new truths as ever it was to those intrepid voyageurs who threaded their way across the ocean, entered the Hudson Straits or the mighty St. Lawrence and blazed their path across this continent to the Pacific. It may be, at times, a false idea,

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an *ignis fatuus* which leads us on—and we may in our zeal, venture to name our mighty rapid a Lachine—but still it is truth and truth only that is our one endeavour.

Our pursuit must never be aimless and I invite the executives of each of the sections to assist in directing the forces of the succeeding year in such a way as will ensure a maximum of success and a minimum of wasted effort. The suggestions thus handed on will ensure a steady development.

Even as it is, what a wealth of experience is available for each of our fellows who makes his attendance a serious effort, who takes the programme and directs his reading along the lines it suggests, and makes it a resolve to assist his fellows onward. As iron sharpeneth iron so will such a fellow increase the usefulness of his section.

We hope to issue an advance notice of our season's course of study and invite your careful perusal thereof, and a regular preparation for each evening's task.

During the summer your officers have had a few matters of importance to transact. The Commissioner invited us to a couple of final interviews upon the position taken up by the followers of the various cults seeking to assist us in the pursuit of medical truth, and we have reason to expect that his report has been finished, and that its proposals will presently be laid before the Government and the public. There will be need of a close scrutiny of this report by every Fellow, in a united endeavour upon our part to secure our one aim, that every student of medicine, in the widest application of the term, be required to take the one full course of study and pass the required tests, after which he may practise as he may elect.

It is interesting to note in this connexion that the labour and research of our past president, Dr. Ferguson, in the preparation of the articles upon "False Systems of Healing" has been recognized officially by the American Medical Association's Council on Medical Education.

As you are aware, the Academy held a special meeting in July and placed upon record its view upon the failure of the Government to place the care of the returned soldier in such hands as the profession could trust and respect. I regret to say that matters, up to the present, have not been improved, nor have either the daily press or the Government shown any serious appreciation of the fact that the questions involved are primarily medical and as such amenable only to a medical tribunal.

The Academy has also taken steps to meet the attempt to victimize the public by the exploitation of various alcoholic beverages known as "Tanlac", etc., etc., and trust that presently we shall see the termination of this newest method of trading upon our aches and ills.

The House Committee has made new arrangements regarding the caretaking, and measures to prevent a recurrence of the discomfort occasioned last winter through inadequate heating.

Shortly after the inception of our Academy, steps were taken to ensure for our citizens a supply of healthy milk, and a Milk Commission was appointed by this body. The result upon the milk was very beneficial, but the process has been costly to the public pocket. Is it not time that we as an Academy urged a further step forward, the municipalization of the entire milk trade of the city, including the control and ownership of the dairy farms, the purification and preservation of the milk, and its distribution to the citizens? This would greatly cheapen an essential article of food, by the cutting out of competitive advertising, and the present prodigal waste of time and labour in distribution.

As an Academy, our duty with regard to venereal diseases is not yet discharged.

The striking increase in the prevalence of venereal diseases in Canada is a question that must interest the whole medical profession. There are those who insist that the increase does not exist, but stubborn facts make apparent the falseness of their claim. The reluctance of legislative bodies to deal with this question is to be greatly regretted and there can be no reason why this province should not include these diseases in the Contagious Act. A very slight alteration of this Act would enable the police and other authorities to place the dangerous elements in society under control. The women of the street, who at present are at liberty to come and go as they please and who carry on their wretched traffic unhindered, could thus be taken care of and treated in the early stages of disease. This would enable the authorities to weed out the defectives among these classes and as a great proportion of the women actually engaged in the illicit traffic are definitely feeble-minded, they might be segregated, if the citizens would wake up to their responsibility.

It is, in my opinion, the duty of every physician to educate the people of the community to a knowledge of the present peril and to suggest this most sane way of dealing with it.

The well-known cover of Bairnsfather's "Fragments from France" bears the cartoon of two Tommies sitting in their dug-out contemplating the effect of a well-placed enemy shell, and remarking, "There goes our blinkin' parapet again," an endeavour by the artist to give utterance to the feeling of being—as the "Student in Arms" has it—"blasphemously fed up." We, as an Academy, are "blasphemously fed up" with the misdirection of the medical side of Canada and the great war by our Government and our Militia Department. The profession in Canada has always occupied a high position, in the standing of its institutions of medicine, in the training and quality of its rank and file, and in the skill and wisdom of its leading practitioners—but we fail to note that a single endeavour has been made by those who govern to make use of these in any fair and proper way, although our profession has been equal, at least, to that of any other of the Allies, in the way it has come forward to assist—and to die when needful.

Compare the action of the United States. No sooner was war declared than the acknowledged leaders of medicine in every single department were called to Washington to consult on the most scientific way in which the trained profession could be utilized, and these committees were given full control as to the selection of men to fill the various positions. To take one instance—the oto-laryngologists were listed to the number of 5,488, and in July every one of these men was circularized, and the reply card indexed. In Canada, it has been most haphazard. A few of our leading physicians and surgeons have been sought out, but the majority have not been called on, and in not a single instance —except this summer when the Dominion Medical Council was invited, I understand, to offer some suggestions—have any of our medical associations, university or scientific bodies, been used for their legitimate purpose. There has been no "Win the War" policy in medicine.

The recent action of our College of Physicians and Surgeons in circularizing the Ontario profession is a step forward, but for this the government cannot claim credit.

The result of this lack of initiative is self-evident. There has been a complete break-down. The C.A.M.C. is considered by a Parliamentary Committee to be a failure; there is a committee of laymen placed in charge of returned soldiers; our respected Fellow and guest, General Fotheringham, has been dallied with so long at Ottawa that his resignation has been sent in; there is no permanent surgeon-general at Ottawa in whom the profession can place confidence, and if there were, he would not have a voice at the table of the militia council. My thought upon this subject is well expressed in an editorial of the *Journal* of the American Medical Association, of July 28th:

"The medical service has not been given the rank and authority which its importance deserves, and the work of the medical department, and the views and opinions of medical officers, have not been given sufficient weight by military men. To permit an officer with military training alone, no matter how high his rank or how brilliant his attainments as a soldier, to dictate conditions regarding the hygiene and sanitation of troops and the management of hospitals is as ridiculous as it would be to give a surgeon authority over the artillery or the aviation corps. Subject always to the necessities of warfare, the military and medical services must be on an equality. Each line of activity requires highly specialized technical training. To permit either one to encroach on the field of the other is not only absurd, but is often suicidal. Especially should there be the closest coördination and coöperation between the military and medical officers in order that the medical Corps may be of the greatest assistance. This is the lesson which Japan learned in Manchuria, and which the British have demonstrated on the Western front."

And in the utterance of Lord Esher, in the London *Times*, of February 3rd:

"Certainly the control of the adjutant-general's branch over the Royal Army Medical Corps was and is responsible not only for the early failure to grip the medical factors of the war, but the hampered conditions under which the Surgeon-General worked. His triumphs and those of the Royal Army Medical Corps have been achieved in spite of obstacles that the subordination of science to ignorance, and of elasticity to military discipline explains, but cannot justify."

The passage of the Military Service Act, at Ottawa, raises two questions of intense interest to our profession. First, What number of army surgeons can the profession of this country legitimately supply; and, second, Shall students entered upon their course of medical study be liable to the draft?

In August last, the Central Medical War Committee of Great Britain informed the Government that after a careful survey of the whole of England and Wales, it is of the opinion that no more physicians can be called on to take commissions in the Army Medical Corps, without seriously endangering the supply of physicians for the treatment of the civil, community.

In Australia the stress has become so great that the senior practitioners are being called upon to come forward and take on the younger men's job, and it is announced that the Department of Defence will send to France within the next two months every available physician.

In New Zealand we are informed that "as regards medical service for the civilian population the position is now becoming very acute". The minister of public health there recently pointed out the absolute necessity which had arisen for the mobilization of the medical services, and the exercise of control in the location of physicians.

I have recently been invited, semi-officially, to ascertain who among the Toronto practitioners beyond the army service age are ready to step forward and assume the duties of house-physicians and surgeons, laboratory and dispensary assistants.

So far as figures are obtainable, 75 per cent. of the classes which have been graduated at our University since the war began have joined the C.A.M.C., or R.A.M.C. For three years past, therefore, the accessions to the ranks have been inadequate to supply the loss through death.

The second question is also important. This arose first in Britain, where, as it has proved unfortunately, all students of medicine under the fourth year were drafted as combatants. In the United States the question is now to the fore. The registration recently made covered 8,983 students of medicine, or 85·9 per cent. of all students upon the rolls of the medical schools. In Canada, at the outset, the men in the senior years were advised to remain at their studies, but the juniors were not discouraged from enlisting. The draft will affect as large a proportion of the medical student body in Canada as in the United States. There, however, the question has been solved by the ruling of the President, that all hospital interns, and medical students of the second, third, and fourth years, may be enrolled in the Enlisted Reserve Corps of the Medical Department, and pursue their studies while remaining in the military service of their country, but always liable to a call to service by telegraph or letter.

A resolution was adopted by the Canadian Medical Association at its last meeting in Montreal, urging upon the Government the necessity for the mobilization of the entire profession, in order that all those fitted for service overseas by age, and health, and freedom from family duty, might be sent forth, and further that all others might be assigned to such service at home as their training, and the necessities of the Country demanded.

The war is making great demands indeed upon our profession. I do not know of any other profession, where similar incomes have been thrown to the winds at the call of duty, and yet we must be prepared to do still more.

It will be wise if this Academy make representations to the Government both as to the best means of providing medical attendance for the people at home, and their sons overseas, and also as to the provision of a continuous supply of students, to fill the ranks of the profession depleted by death and enlistment.

It is also true that the relatively low rank under which medical officers serve, handicaps their work both individually and collecttively, and in Canada a low estimate has been placed upon the Army Medical Service, the result of defective legislation which should have been remedied long since.

It is not too late yet for the Government to summon "intelligence" to its aid. Numbers of our profession have gained experience through service that would make it possible for them to give advice that would bring order out of the chaos that exists, and it is due to the high intelligence of our profession that the Government get the best advice which the leaders of medicine can supply. But we want no party politics. Let efficiency alone be considered, whether in appointments in Canada, Great Britain, or the field.

In looking over the work of our Academy in its many phases I am confronted by the surprising fact that we have as yet made no attempt to establish a Historical Museum. There are many interesting details connected with medical institutions which have passed out of existence, with leaders of the profession who are dead and gone, historical facts, relics of those we respected, medical diplomas, documents, etc., etc., which it should be the business as well as the profit of our Academy to collect and collate.

With the cordial permission of your council, I have appointed a committee of interested Fellows, and have great pleasure in handing the treasurer a cheque to form the nucleus of a special fund to start this branch of our legitimate work. I invite your coöperation. Give your ideas and information to the members of the committee, and keep an eye open to every opportunity which offers to obtain material for our historical museum.

Where questions of public welfare relating to medicine are concerned, the great obstacle to the proper presentation of the weight of medical opinion before parliament and the public, has been the lack of organization of the profession. Little attempt, if any, has been made to achieve this end by the College of Physicians and Surgeons, who stand, naturally, as the representatives of the profession in this province, nor has this slight attempt been followed by any measure of success.

The Ontario Medical Association, as the Provincial Branch of the Dominion Association, has been labouring for some years to evolve a scheme, and basing its efforts, to an extent, upon the plan followed so successfully by our confrères in the United States, hopes this fall to put the matter through its final stages, and secure a ready and certain method of bringing medical opinion to bear the full weight to which its training and intelligence entitle it.

It is unnecessary to point out to this body the need which has brought this action about. There are so many questions in which it is highly necessary that the profession speak out with a concerted voice so that the public may be informed, or warned it may be; or, on the other hand, that a professional body exists, which the representatives of the public may consult before legislation is finally enacted. The success of this Academy is largely due to the influence it has exerted upon such questions as the Workmen's Compensation Act—the presentation of evidence before the Medical Commission, etc., and those who attended our annual meeting last May and listened to the reports of our various committees, must have been amazed at the scope of our energies. If the Academy of the capital of the province could accomplish so much, what cannot be effected by a properly organized body representing the entire medical opinion of the Province and later of the Dominion, if we can induce the profession of the other provinces to follow our example? Had a Dominion body existed, such as I have indicated, we should not have seen a body of laymen appointed to tell the profession what to do medically for the returned soldiers.

To my way of thinking, whether it be in matters military, hospital, or of public health, the effect of legislation has been to bring it about that our profession has been degraded to be the hewers of wood and drawers of water for those who advertise themselves as being business men, and this reproach "that we of the profession are not business men" is often hurled at our heads. By the reorganization which is planned, every reputable physician in the province will have an opportunity of expressing his views upon all matters of public import medically, and in such a way that no legislative body can afford to pass them over lightly.

While the public has a duty to the profession, the profession on its own side has a duty to the public, and the occurrence of such unfortunate incidents as took place in connexion with a well-known criminal case of the past summer in this city is a disgrace to us.

Ignorance of responsibility by the attending physician and the hospital authorities is a reflection upon the training of the student, and the knowledge that every licensed practitioner should possess of the code of ethics which we profess.

Are you each personally aware that you are obligated to obey a code of ethics? I wonder. Nevertheless the law does not excuse a man because of ignorance, and our By-law No. 10 is decisive. We are bound by the code of ethics of the Dominion Medical Association. How many of you have even read these, let alone committed them to memory, and yet you are bound to these by oath. I am afraid students enter upon the study of medicine too often as a means of livelihood, or business, and do not know that they thereby assume great responsibilities. As was stated in a *Globe* leader of a few weeks since:

"Medicine is not a private profession. The medical man today is not merely a private practitioner, he has a social obligation; he is a trustee for society, his duty to his patient and to his patient's friends must be read in the unwinking light of his own social responsibility as a guardian of public life and a leader of public opinion."

"The public good is the moral standard by which professional service is tested."

"Privileges recognized by the public and protected by parliament give duty supreme claim and make that obligation binding upon every member of the profession."

I am not desirous of depreciating the high standard of conduct which characterizes our Fellows. My wish is to point out that we must force all the members of our profession to recognize that they must think and act as we do, or leave our ranks. We are far too lenient with those who commercialize our calling. We are disposed to protect the failings of our brethern, even when we recognize that those failings are due to a low moral standard, and not to the inadvertences which the experience that comes with years will remedy. Medical science is advancing rapidly. No one among the public can point the finger of scorn at what our profession is doing for the world. Are we at all keeping pace with this advancement in the recognition of our moral and ethical responsibilities? Is the practitioner of to-day standing in each community upon a higher plane than did his predecessors? Is he the leader in all measures for the public good?

We boast of our advance in knowledge, but "knowledge is power, and power is not for personal advantage, or for private gain, but for social service, and for the public good."

Let us beware where we stand, lest we fall.

The very humblest man or woman who receives the license to practise medicine should know that by that act, the honour of the highest of the professions is committed to their charge; that whether they walk abroad or sit at home—they embody in their persons the dignity and moral responsibility attached thereto, and that they stand pledged as the Hippocratic oath has it, "that with purity and with holiness they will pass their lives and practise their Art."

What can we do, beyond individually setting the highest example we know how; frowning down all suggestions in thought or expression which savour of a lower standard; seeing to it that our new Fellows, as they are elected, receive instruction in the rules which govern our conduct, and requiring of those bodies which educate students of medicine, a definite course of teaching from such living exponents of our standards as one whom I see before me to-night.

Personally, I have always regretted that such matters form so unimportant a part of the medical curriculum at the universities, nor can I find that a graduation oath is demanded by the College of Physicians and Surgeons, or by any of the universities of this province, with the exception of Queen's, while that administered to the graduates of McGill is in Latin.

It may be asserted than an oath has little weight, but no Masonic initiate could forget the oath he takes—and its administration would, at least, serve to draw the attention of the attestant to the solemn character of the service upon which he enters, and there is no reason why every practitioner should not legally be compelled to keep a copy of the oath in a prominent place in his office as a perpetual reminder of his duty. The oath should be administered at graduation in no merely formal way, but with a solemnity befitting its nature.

The sin of the educated practitioner is, as a rule, one of ignorance, and as things are now conducted, there is little wonder that this ignorance exists.

An evil which has been very prevalent among the profession to the south, and which was a factor in the inception of the American College of Surgeons, has shown its Hydra head in Ontario and in Toronto. I refer to fee-splitting.

To mention it is to condemn it. It is a frankly dishonest transaction which stamps as a fraud the practitioner who demands his pound of flesh. It destroys all possibility of the patient obtaining an honest opinion from his attendant if that attendant is to share in the fee of the operator to whom the patient is referred by his attendant. Timothy was assured by St. Paul that the love of money was the root of all kinds of evil. This is one of the evils which not only injures the parties to the transaction, but commercializes the profession and gives sure and certain ground for distrust on the part of the public.

It is to the interest of this Academy to "wage a relentless war of extermination upon this degrading and dishonest practice, so fatal to professional honour and integrity".

I am credibly informed that men in this city have endeavoured to solicit the operative work of practitioners upon the frankly stated basis of a fifty-fifty division of the fee, and I have personally been solicited by a general practitioner to state what percentage he might expect to receive upon referred cases. The physician who sells his soul of honour for a paltry fee, and the would-be surgeon who builds up his experience upon cases referred upon a financial basis of share and share, are equally abhorrent, and with your help we will drive them from our midst.

This naturally introduces the subject of the training of the surgeon. Surgery has been well defined as "a science founded upon certain fundamental principles, without a thorough knowledge and understanding of which, no man can do himself or his patient justice". As Dr. Finney has said:

"No doctor, no matter who, without a thorough surgical training, has the moral right to attempt to make a practice of surgery. He may succeed in doing certain minor operations or even certain major operations, well; he may learn to do mechanically certain things satisfactorily to his patient and to himself, and he may have a fair percentage of success; but, sooner or later he will meet his limitations, and in attempting to go beyond these, with his small and imperfect equipment, some of the catastrophies of surgery will happen, and then who pays the price of his temerity and ignorance? Yes, let me repeat, surgery is far too serious a matter to be lightly undertaken by those who are not thoroughly trained in the fundamental principles underlying its proper performance."

It is not necessary to leave this city to see in well equipped operating rooms, heinous crimes committed against the most fundamental surgical principles and technique. These are done by men who for the gain of filthy lucre would shorten the regular and necessary steps to a reputable surgical practice. They will not agree to spend several years as an assistant and understudy to a surgeon of experience, but by various underground expedients, solicit cases upon which they may try their prentice hand.

No hospital which values its reputation or which appeals to the public for financial support upon humanitarian grounds, has the slightest right to open its operating rooms to any but tried and experienced surgeons of established and good repute, unless it be in the capacity of assistant only.

We read everywhere articles suggesting that the one great effect of the war will be a new world—a fresh outlook, an upsetting of accepted aspects of truth—a fundamental change. In fact, it will usher in a reign of "peace and good-will to men". What, we are asking, will be its effect upon medicine?

Those of you who have read the second volume of "A Student in Arms" will have been struck by the chapter entitled "The Good Side of Militarism", where Donald Hankey refers to the fact that in pre-war days "self realization" was considered to be a primary duty of every man and woman and the words "Fear God and keep His commandments" amended to read "self realization"—but that as a result of military discipline as practised in the twentieth century by the democracies of the world, we have learned the "unimportance of individuality, realizing that in a national, a world crisis, it counts for nothing"— the good soldier has learned the hardest lesson of all—the lesson of self subordination, to a higher and bigger personality. He has learned to sacrifice everything belonging to him personally, to a cause that is far greater than any personal ambition of his own can be.

In medicine we have seen great things—the death rate of the army from disease reduced far below that of the civil community in the times of peace; camp sanitation; the purification of water; minute attention to the bodily care of marching soldiers; vaccination against typhoid and tetanus. These have achieved amazing results, and honours are pouring in upon those of our profession who have taken the lead in demonstrating what results may be obtained when medical science is utilized to the full. We are, everyone, proud of our own Colonel Nasmith, C.M.G.

Is it not evident that the effect of all this is to exalt the preventive side of medicine; to reveal to the world that syphilis, the care of the child of school age, tuberculosis, etc., etc., may be taken out of the hands of the family practitioner and assigned to the care of the State? May these not be the signs of the times that the day of the competitive physician and surgeon is over and that presently he must become a member of a panel and have removed from him the opportunity to exploit his experience for mere gain—that as his training is even now largely paid for by the State so his employer hereafter may be that same body. The greatest good of the greatest number.

What will follow will be—and already there are ominous movements in the not too solid ground on which we stand—that those who teach in our clinical and final subjects will be whole time men, paid by the State at a salary commensurate with their responsibility and with an equal allotment of money for the maintenance of the laboratory side of each department.

I am not a prophet, but let us not mistake, there are great changes coming.

Fellows of the Academy of Medicine, let us then be up and doing, and remembering the words of our example, the Great Physician, "work while it is day".

The services of a unit of American medical women have been accepted by the French government. The unit, which is under the direction of Dr. Caroline Finley, will leave for France shortly. The activities of the unit will be directed chiefly towards providing medical attention for the women and children in devastated districts but, if required, its services will be given to the wounded. A hospital of one hundred beds will be established in addition to small auxiliary units which will be provided with ambulances and operate each within a certain district.

THE TECHNIQUE OF NERVE SUTURE

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THE experiences of nerve work as here related were gained while acting as surgeon-in-chief at the Granville Canadian Special Hospital in Ramsgate. This series of fifty cases covered a period of eight months in 1916.

It is with regret that I was unable, owing to the demands of the military situation, to follow up the majority of my cases as they were invalided to Canada at varying times from six weeks to six months after operation.

I desire to point out certain details of the operative technique and in addition some of the general considerations of the treatment upon which stress is being laid by the profession at the present time. It has been possible to follow a few cases till results of operation began to manifest themselves, and full reports of six cases are appended. Cases "A" and "B" are complete lesions of the musculo-spiral nerve. Case "C" is an incomplete lesion of the external popliteal. Case "D" is an example of axillary aneurism complicated by incomplete lesions of nerves of the brachial plexus. "E" is reported to show an exaggerated form of traumatic neuritis. "F" is one of complete anterior crural paralysis anatomically unsuitable for suture, showing the results of tendon transplantation.

GENERAL CONSIDERATIONS

The present policy of the Canadian authorities, as voiced by the director of medical services, is that Canadian troops with peripheral nerve lesions be sent to Ramsgate. If operation be indicated and the patient is in a fit state by reason of his wounds to have this done, the operation is performed in Ramsgate, and after a certain length of electrical and postural treatment there, he is, as a rule, transferred to Canada.

Read at the forty-eighth annual meeting of the Canadian Medical Association, June 13th, 1917.

The reason for this is obvious, as it is generally accepted that the sooner damaged nerves are repaired the better will be the patient's chances of a favourable end result.

When the wounded are able to be transported to Canada rapidly, and special institutions are ready to receive them there, doubtless, all cases will be sent directly to the Canadian hospital supplying the area in which the individual may live, and then only will the treatment of surgical nerve cases become truly adequate. The surgeon in Canada will then have the opportunity of treating his cases from beginning to end, which will be a more satisfactory state of affairs for all concerned.

Cases of peripheral nerve lesions require uninterrupted treatment for a considerable length of time. This can only be obtained in suitable institutions, fully equipped in order to be able to carry out the various forms of treatment required. On this account nerve suture work should only be done by surgeons attached to hospitals that can hold their various cases so that they may be treated to finality. Tendon transplantation is often available in cases where nerve suture has failed, and no man should be finally discharged until the question of its advisability has been debated.

I have transplanted the primary flexors of the wrist to the primary extensors in several cases during the last year where nerve suture had failed or was contraindicated, and good results have been obtained.

At the outset it is necessary to emphasize that surgery must run hand in hand with massage, electrical, and postural treatment in the nerve-suture cases. As before stated, any institution where nerve surgery is performed must be adequate to deal with cases in all these particulars.

The break in the treatment where cases are sent from Ramsgate to Canada is unfortunate, but at present unavoidable.

It would appear that the close coöperation between a surgeon and a neurologist is of importance. I was fortunate in having Major Colin Russel, of Montreal, as my confrère, and was much helped by his enthusiastic support in the combined treatment of these cases.

All cases of complete lesion should be sutured as soon as they are diagnosed, provided they are fit for operation. Cases due to bullet wounds that have healed up rapidly may be safely operated upon within three weeks from the time the wound is healed. Wounds due to shrapnel or high explosive require a longer period of time, more especially where there has been bone involvement, destruction of tissue with consequent scar formation or the presence of fine metallic bodies.

These cases often take long in healing, and it is a good working rule to wait at least three months after the wounds have well healed. Undue haste may be followed by sepsis on account of the latent infectivity that remains for a considerable period in this type of wound. I have operated on several such cases three months after healing, and have encountered small sequestra from healed comminuted fractures, small metallic fragments and large areas of scar tissue. If a suspicious wound be swabbed with iodine and alcohol before the nerve is dissected out, and a small cigarette drain inserted for forty-eight hours after operation, no untoward accidents should occur. In a series of fifty operative cases with a maximum length of time between wound and operation of eleven months, a minimum of three months, and an average of five and a half months, all my cases healed by first intention. This high average length of time was due to the fact that the majority of the cases were due to shell wounds, and that all cases were transfers from general or convalescent hospitals in this country.

PRELIMINARY ELECTRICAL EXAMINATION

On admission the average case is tested on three different occasions at intervals of a few days during which time the daily conservative treatment by massage and electricity is instituted with whatever postural treatment is indicated, deformities being overcome at the earliest possible moment. The paralyzed muscles are tested to faradism and galvanism and on the nature of the response to the latter the diagnosis is usually made. It was found in a long series of cases that the results of the varying contractions produced by the anodal and cathodal opening and closing currents are somewhat variable. Great stress is laid on the sluggish reaction to galvanism and on the increased amount of current required to produce it. Throughout the series all complete lesions, verified at the operation, displayed loss of irritability and a sluggish response to galvanism, all cases failed to respond to faradism, and the sensory disturbances were anatomically constant.

Cases showing prompt response to galvanism of some muscles and sluggish response in others supplied by the suspected nerve, should be watched for improvement or otherwise, as a partial lesion combined with scar tissue infiltration may reasonably be expected to exist. Should no improvement occur within six weeks operation is indicated. The progress of such cases should be carefully watched, as the sensory disturbances vary considerably and referred pain may occur on account of traumatic neuritis.

Psychogenetic paralysis, of which a number of cases have been seen, can invariably be diagnosed by the "stocking" type of anæsthesia, the exaggerated deformity of the limb, combined with the brisk reaction of the alleged paralyzed muscle groups to the faradic current.

CONSERVATIVE TREATMENT

Conservative treatment is instituted at once and must be continued without interruption—except during operative convalescence—for a long period of time, as on its persistence depends to a large extent the outcome of the case.

Daily massage to the paralyzed muscle is given for twenty minutes with fifteen minutes of the galvanic current sufficiently strong to produce a fairly marked response. Should trophic conditions be present, as are constantly found in lesions of the median, ulnar and sciatic nerves, *eau courante* or contrast baths are given as an adjunct to massage. Marked swellings and cyanosis of the fingers or toes, with sweating of the involved skin area in some cases, and friability of the nails, are the usual symptoms.

Baths are contraindicated where trophic ulcers or whitlows are present.

Where marked trophic disturbances have existed for some time in combined nerve lesions—especially if complicated by osteomyelitis—conservative measures are of little avail and the question of amputation arises. This has been necessary in two cases; both showed complete lesions of median and musculo-spiral nerves, compound comminuted fracture of the radius with osteomyelitis and discharging sinuses. Trophic ulcers of a persistent type were also present. Amputation through the forearm was done in each instance. A curious phenomenon is sometimes seen in post-operative cases of nerve lesion—generally three to six months after suture—reactions to faradism remain negative and reactions to galvanism become more and more difficult to obtain. Voluntary power may shortly appear in one or more of the paralyzed muscles. In fact a paradox sometimes is present as the muscle has voluntary power, but the electrical reactions are practically non-existent. No reaction to faradism—and reaction to galvanism obtained with the greatest difficulty and then perhaps with a small electrode only. (See case "A.")

Postural Treatment

The paralyzed muscle groups must never be allowed to become overstretched by their opponents or contractures will occur. The overstretching of a paralyzed muscle—devoid of tonicity—if allowed to persist may render the muscle incapable of contraction even after nerve conductivity is reëstablished.

I do not intend to describe at length the various splints devised to carry out this treatment as they are well known, from the writings of Colonel Robert Jones. In lesions of the musculo-spiral nerve, the wrist and fingers should be kept hyper-extended, lesions of the sciatic and popliteals require the foot to be kept at a right angle.

In cases where there is damage to the cords of the brachial plexus, or to the nerve trunks from which they are formed, individual appliances will be required to meet each case.

The commonest injury that we have seen in this region is that which involves the anterior primary divisions of the fifth and sixth nerves—due to wounds in the neck. Here an appliance is required to keep the arm abducted and rotated outwards, the elbows flexed, the forearm supinated, and the wrist and fingers extended. I would like to point out that the long cock-up splint used for musculo-spiral lesions should have a thumb piece to keep the thumb extended and abducted. The splint should be bent transversely in the centre of the palm to allow the hand to rest with the metacarpo-phalangeal joints flexed a little. This is to prevent the hyperextension that has been found to occur in these joints in long standing cases—due no doubt to the hand slipping in the splint. Slight movements of the finger joints may be permitted by the masseur during the daily treatment. These movements increase the circulation in the part, and prevent the formation of adhesions. Under no consideration, however, must undue stretching of the paralyzed muscles be permitted at any time. Some cases of metacarpo-phalangeal stiffness have been brought to my notice presumably as the result of continued immobilization in hyperextended positions, but the alteration to the splint which was suggested by Colonel Robert Jones has prevented recurrence of this complication.

Operative Procedure

ANALYSIS OF FIFTY CASES

Nerves operated upon:	
End to end suture	40
Catgut bridge	2
Nerve graft	1
Partial and scar cases	15
	58
Covering:	
Of fascia lata "sleeve"	44
Covering obtained locally	2
	46

Before deciding on operative interference it is necessary that contractures of joints distal to the lesion involving muscles supplied by the damaged nerve be duly corrected.

Remarks previously made regarding the nature of the wound are applicable at this point.

Standing orders call for preparation of the skin of the thigh, of the same side from groin to knee, as well as at the site of operation. This is for the removal of the flap of fascia lata destined to act as the "sleeve" which is described later.

The following list shows the relative frequency of lesion to individual nerves:

1.	Ulnar	23	
2.	Musculo spiral	13	17
	Posterior interosseous	4	
3.	External popliteal	8	
4.	Median	4	
5.	Sciatic	2	
	Internal popliteal	2	
6.	Cords of brachial plexus	1	
	Musculo cutaneous	1	

As will be seen from the above more than one nerve was injured in several cases.

It is advisable in all arm cases to use a side table so that the arm may be abducted to a right angle and remain steady in that position.

Where there is marked scar tissue formation it is advisable to make one's incision in the line of the nerve above and below the scar and to pick the nerve up at the upper and lower level where it lies in its true anatomical relationship with surrounding structures. The advantage of this procedure is obvious as it is a tedious task searching for a nerve imbedded in scar tissue. These nerves are often destroyed for a distance of one to three inches so that large dissections are required above and below the site of injury to make up shortage sufficient to give end to end apposition.

Whenever end to end suture can be obtained by any means, nothing should be left undone to bring it about.

As will be seen a catgut bridge was used on two occasions in large gaps where other means failed to get end to end apposition. The gap should be joined by chromic catgut sutures, and the whole covered in by a fascial "sleeve". However carefully the "sleeve" covers in the gap the chance of it becoming filled with blood-clots which organizes to form fibrous tissue appears very probable. If the gap is of any length it would seem that the operation defeats its own end. A case of reoperation where primarily, as far as one can judge, the nerve ends had been so joined, showed dense scar intervening between the cut ends.

In one case of an ulnar nerve lesion in the forearm there were four inches missing from the nerve when the ends were prepared. The nerve ends were grafted into the median; the result of the operation I do not know.

In dissection the nerve should be isolated above and below the fibrous tissue as before stated. The nerve should be carefully loosened from its bed at these points and a length of half inch tape or cut gauze gently placed beneath it. Hæmostats are attached to the ends of these tapes and so loops are formed on which gentle traction may be exercised while dissection of the nerve from above and below is made. This dissection will be found to be easy and without danger to the surrounding structures. The use of the loops prevents the nerve being pressed on during dissection by the indiscriminate use of forceps. Where dissecting forceps need to be used a special type made by Messrs. Schaerer, of Berne, is useful. The end of each blade is shaped to half a circle and covered with fine rubber tubing, so that the nerve can be held without pressure. Three sizes of forceps are available.

Scar tissue should be dissected in the neighbourhood of the lesion after the nerve ends are isolated and freed. Stimulation of the nerve by means of the faradic current is now undertaken—

above and below the lesion where dissection has not produced anatomical loss of continuity—below the lesion only where this loss exists. A Bristow coil with metronome interruption appears the most suitable apparatus—a pad can be placed on some part of the body away from the seat of operation. The nerve is now stimulated in the whole of the circumference by means of a single sterilized electrode—a long silver probe is advised by Mr. Bristow, of the London Military Orthopædic Hospital—I have also used a twin electro with success. The faradic current thus applied will readily determine as to whether the lesion is complete or partial, if applied to healthy nerve above the block.

In the vast majority of cases no reaction is obtainable in complete lesions when the electrodes are applied below the lesions, as the lower end degenerates in a few days. Should the lesion be complete the preparation of the ends for suture should be the next step.

If definite nerve bulbs are found these should be cut transversely at distances of one-eighth inch until healthy nerve tissue is encountered, The fibrous end of the nerve should be held with mouse tooth forceps and cross sections made with a sharp knife, almost, but not quite, through the nerve. This plan obviates undue handling of the nerve which only is touched by the forceps at its fibrous end. When healthy nerve is recognized by the protrusion of the bundles the last made section is completed. On no account should nerve sections be made with scissors which cause crushing of the fibrils. The nerve sections are sent to the laboratory and slides are made as a routine. The amount of shortage in the nerve can now be gauged and steps taken to make this good so that end to end suture can be accomplished.

The shortage can be overcome in four ways:

1. By flexion of the intermediate joints.
2. By free dissection of the nerve for a considerable distance above and below the lesion.
3. By translation of the nerve path to a straight line.
4. By dislocation of the nerve.

1 and 2 only are applicable to nerves of the lower extremity. 3 is applicable to the ulnar and musculo-spiral, and 4 is referable only to the ulnar at the elbow joint. By these means a gap of over two inches has been readily overcome.

I have chosen the example of an ulnar nerve lesion in the forearm for the purpose of description of the closing stages of the operation, as it is in this situation that the worst types of nerve shortage occur.

The nerve must not be unduly pulled upon although a certain amount of gentle traction is permissible, if necessary, as there is little doubt that the sheath is shorter than the nerve fibres.

With regard to the shortage in the ulnar nerve free dissections must be made to the middle of the upper arm and the nerve is dislocated from its tunnel behind the internal condyle and brought to the centre of the anti-cubital fossa. The nerve must be dissected high enough up the arm to enable it to be brought into a straight line from the axilla to its normal position in the forearm. The new course of the nerve causes it to lie between the superficial muscles of the forearm behind and the fascia and fat superficially. The aponeurotic band between the two heads of the flexor carpi ulnaris must be divided with care, as one wishes to conserve the branches to this muscle and to the ulnar head of the flexor profundus digitorum which come off at this level.

Where the lesion is below the level of the middle of the forearm it is sometimes convenient to free the nerve with a dissector beneath the muscle and to push the upper segment upwards, bringing it out through the opening made between the two heads of the muscle. This was done on two occasions without damaging the two nerve branches before mentioned. This method is quicker and causes less trauma than the full dissection of the flexor carpi ulnaris which is the only alternative. The bringing of the ulnar nerve superficial to the flexor carpi ulnaris in the upper half of the forearm lengthens it by more than half an inch. By these means almost any gap that is likely to be encountered in ulnar nerve lesions may be overcome, and the cut ends of the nerve should now come together without tension. A temporary stitch of fine catgut is placed through the nerve ends with a fine non-cutting needle at a distance of about half an inch from each extremity, this stitch aids the surgeon in the permanent suture. The nerve is sutured by means of the finest domestic sewing needle, and the finest white sewing silk obtainable. I would advise the use of the No. 9 "Calyx" self-threading needle, obtainable from department stores. A continuous stitch is put round the nerve involving nothing but its sheath. This will be found to be easy, as despite the protusion of the bundles the sheath is capable of being stretched. It is important that eversion of the sheath edges be brought about, and very fine and accurate stitching is necessary to produce this result. This eversion will minimize the risk of subsequent interstitial fibrous formation. The catgut "stay" stitch is now removed and the whole circumference of the suture examined.

An autogenous graft of fascia lata is now removed from the thigh. The outer side of the thigh about its centre is opened by means of a semicircular incision involving the skin and subcutaneous fat. This flap is now turned down and the fascia lata is seen. A parallelogram of fascia is now removed varying in size with the calibre of the nerve it is desirous to cover. It is well to err on the large side as the fascia tends to contract on separation and the "sleeve" must be easy fitting. I use the term "sleeve" advisedly to emphasize the fact that an easy fit is essential, and the covering should bear the same relationship to the nerve that a "sleeve" does to the arm.

When the fascia is removed from the subjacent muscle, it will be found to strip quite easily on account of the areolar tissue that exists between the two. This side must be the one in contact with the nerve.

It will be found advisable to grip the corners of one long side with mosquito forceps. Two similar hæmostats are placed beneath the nerve and these grip the corresponding corners of the other side of the flap. The flap is now drawn beneath the nerve and the hæmostats brought into apposition at the upper and lower ends. An end to end suture of the long edges is done with chromic catgut leaving long ends at the top and bottom. A tube of fascia now envelopes the nerve with a length of catgut at either end. By this means the "sleeve" can be slid up or down the nerve until its centre covers the suture line. The "sleeve" is now anchored to adjacent tissue both top and bottom with the catgut ends before mentioned.

I have emphasized this method, as some such scheme will be found to save time on account of the marked propensity for curling up that the fascial flap always displays.

The reason for the preference of fascia lata over local fascial flaps is twofold.

(a) On account of the amount of areolar tissue present on the inner side of the fascia lata, this appears to prevent strong fibrous union to the subjacent nerve sheath.

(b) Latent infection may lurk in tissues in the region of the initial wound where suppuration has existed.

The disadvantages of a second wound appear to be slight, as if the hole in the fascia lata be sutured with chromic catgut, and the patient kept in bed for fourteen days, the risk of a quadriceps hernia is remote. I have no experience in the use of "cargile membrane" as a covering. It is well spoken of by some of my colleagues. As I have had no trouble in any of my cases, I hesitate to begin using a foreign body where an autogenous graft is available.

All cases of complete nerve lesion do not show the bulbous ends previously described. After dissection the nerve sometimes appears normal to the eye. On palpation the fibrous block is generally recognizable as it feels harder than normal nerve. Should faradic stimuli fail to pierce the block it is advisable to divide the nerve at its hardest point and then to section each end until healthy nerve is reached. Where interstitial fibrosis is present one feels a grating sensation on the knife when making the section of the nerve.

Where there is much destruction of nerve and translation is not available—as in the median and sciatic—it is sometimes necessary to dissect out fibrous tissue from between the nerve bundles instead of sectioning until healthy nerve is reached. This is done in order to procure end to end apposition when it cannot be otherwise obtained. A fine bladed knife such as a Von Graefe will be found useful, and careful dissection is necessary.

Partial lesions require careful dissection as it is probable that two or more bundles retain their conductivity. All scar tissue must be removed from the site of lesion until healthy bundles are seen. A wedge shaped gap is now found to be present and some dissection of the nerve from its bed will be necessary to coapt the edges of this gap without tension. When the suture is complete the nerve displays a bulge at this level. In one of the cases in the series the nerve after dissection showed that only one bundle retained conductivity, and the gap of destroyed nerve tissue was very wide. Here a complete section of the nerve with end to end suture was made. It was felt that on account of the wide gap strangulation of the remaining bundle would occur if the case were treated as a partial lesion. Some cases display no damage to the nerve bundles, but nevertheless the lesion is apparently complete. When the scar tissue is removed the calibre of the nerve is much lessened and it may even be quite flattened. Occasionally the nerve will be seen to bulge at the seat of injury immediately the constricting bands are divided. (Appendix "D".)

It is advisable to divide the nerve sheath longitudinally in one or more places at the site of the lesion and to cover the area with a "sleeve" of fascia lata. This is to counteract adaptive contracture of the sheath that has probably occurred. Referred pain occurs solely in partial lesions due to scar pressure from without or within the nerve sheath. Free removal of all fibrous tissue is necessary both surrounding the nerve itself and also between the individual nerve bundles, and a fascial "sleeve" must be used.

Case "E" is of interest in this respect in that it shows what occurs to the fascial flap after it has remained *in situ* for some time.

Where flexion of joints has been necessary to procure end to end anastomosis, six weeks should elapse before any extension is permitted, and this should be very gradually brought about.

In the suturing of small nerves a straight needle is often a disadvantage; this statement is especially referable to the posterior interosseous, which is in my experience the most difficult to suture. It is probably better practice to transplant tendons at the outset instead of suturing this nerve, especially if the damage has occurred after it has pierced the supinator brevis. The flexor carpi radialis can be attached to the three extensor tendons of the thumb and to that of the index finger, and good results have been quickly obtained.

Calyx needles are not made in curves, and I found it impossible to obtain self-threading curved non-cutting needles of sufficient fineness. Sir Edward Rigg, C.B., an authority on metallurgy has given me great help on showing me how to make one's own curved needles. By the careful drawing of the temper of Calyx or other domestic needles they may be bent to any desired curve without losing their point, strength or resiliency. The needles are heated on a metal plate by means of a spirit lamp. The plate must be sufficiently large to prevent any of the gases of the flame coming into contact with the needles, which must be constantly kept in motion whilst being heated. The needles are heated beyond the straw stage to a light blue, and then they are rapidly transferred by forceps to a cold plate of metal. Here they immediately turn dark blue. By means of a specially made pair of pliers, whose blades are concave-convex and graduated, any desired curve may be wrought on the needles.

I mention this point in case others find the same difficulty in obtaining suitable needles.

AFTER-TREATMENT

I wish to emphasize the fact that peripheral nerve lesions require prolonged after-treatment. This should be given in institutions suitable to the purpose at which the soldiers can attend as out-patients. The institutions should be equipped with complete electro-therapeutical establishments, and also with curative workshops. These workshops are used for functional reëducation.

Where needed, arrangements should be made for professional reëducation which should go hand in hand with military orthopædic treatment. The full consideration of this matter, which is provoking much discussion in military circles at the present time, does not come within the scope of this paper. The matter is being diligently and thoroughly taken up by the Pensions Minister.

It is with regret that I am unable to be present at this meeting, but I hope that these remarks, based upon my errors of commission and omission, may prove of interest to my confrères.

COMPLETE LESIONS—CASES "A" AND "B"

"A."—Capt. T., G.S.W. through centre of upper arm (left), December, 1915.

Preliminary examination showed sluggish reaction of all muscles supplied by the musculo-spiral nerve, with exception of the triceps, larger galvanic current required than on corresponding muscles of the other arm. No response to faradism. Treatment for six weeks by massage and galvanism, and long cock-up splint.

Operation 30–4–16. Exposure of left musculo-spiral nerve from where it perforates external intermuscular septum. Nerve found bound down on the mesial aspect, all adhesions freed, two bulbs lying within a half inch of each other and attached together by fibrous tissue were found. The bulbs were separated and sectioned until healthy nerve fibrils appeared. End to end suture with fine silk. Junction covered by fascia lata "sleeve". After-treatment—massage—*eau courante* baths, galvanism, and long cock-up splint.

1–11–16. Reaction to galvanism very sluggish and difficult to obtain—strongest current and fine button electrode required—this after several attempts. No reaction to faradism. Voluntary power in supinator longus and extensor carpi radialis longior appearing.

5–12–16. Voluntary power beginning in extensor carpi ulnaris. Short cock-up splint substituted.

7–1–17. No reaction to faradism in extensors of wrist and fingers. Reaction to galvanism so slow and weak as to be scarcely perceptible.

12–3–17. Strong voluntary power in primary extensors of the wrist. Voluntary power in extensors of fingers beginning, can extend fingers with wrist slightly hyper-extended. Home service at present.

"B"—Pte. S., Canadian Infantry.

Admitted 31–8–16. G.S.W. outer side right arm two inches above the elbow emerging at the back of arm midway between elbow and shoulder.

3–6–16. The humerus was not touched. Drop wrist came on immediately. There is loss of sensation over the radical side of the dorsum of the hand. Extensors of wrist and fingers do not react to faradism and only sluggishly to galvanism with the exception of the extensor carpi radialis which responds promptly.

Operation 25–9–16. Five inch incision over the course of the musculo-spiral nerve on the outer side of the humerus was made. The nerve was exposed and a block of fibrous tissue found. There was no conductivity either above or below the lesion to faradism. Nearly an inch was removed, healthy fibrils obtained, and end to end suture performed. "Sleeve" of fascia lata used to cover the junction—wound closed with catgut and clips—long cock-up splint applied.

After convalescence—conservative and postural treatment continued.

9–3–17. Supinator longus and extensors of wrist and fingers do not react to faradism, reaction to galvanism slow and weak. The patient has voluntary power in supinator longus and extensor carpi radialis, and slight voluntary power in extensor carpi ulnaris. Treatment continues.

INCOMPLETE LESIONS—CASES "C" AND "D"

"C"—Cpl. W.— C.M.R.

Admitted 17–1–16 with history of gunshot wound left thigh on 8–12–15. Immediately after being wounded was unable to flex ankle or extend toes. Two days later phlebitis supervened. For two weeks after the injury a numb feeling was complained of all over the foot and up about the knee cap.

Wounds in thigh not healed, foot kept at right angle with a Thomas rectangular shoe.

16–2–16. Tibialis anticus and peronei react to condensed current, all muscles react to galvanism promptly, and with small current. Partial lesion of external popliteal diagnosed. Patient walks with boot and fixed posterior iron to prevent foot drop.

16–5–16. Voluntary power returning in anterior tibial group, No power in peronei.

14–6–16. Peronei and extensor communis digitorum do not react to faradism. Tibialis anticus has regained voluntary power.

21–7–16. No improvement.

7–8–16. Voluntary power of anterior tibial group has quite gone. Muscles react poorly to galvanism.

Operation advised.

10–8–16. Operation. An eighth inch longitudinal incision in mid posterior line of left thigh from level of the great sciatic was isolated at the lower level of the gluteus maximus. The sciatic was found to divide into the popliteals at a high level. Both trunks were embedded in scar tissue especially the external one.

The external popliteal was dissected from the scar tissue, but the sheath appeared intact, and palpation could discover no hard points on the nerve. Conductivity to faradism was poor, but complete, much inferior to that of the internal popliteal from around which all fibrous tissue was removed. A longitudinal incision was made in the sheath of the external nerve one and a half inches long. A "sleeve" of fascia lata covered the nerve at this point.

14–9–16. Regaining voluntary power in anterior tibial group, can voluntarily flex the ankle.

26–9–16. Invalided to Canada.

February, 1917. A letter from patient states that he has continued to improve, and is very pleased with the result.

INCOMPLETE LESION COMPLETED BY ANEURISM

"D"—Pte. K., Canadian Infantry.

6–4–16. Admitted with history of S.W. 22–9–15. A shrapnel bullet entered the posterior fold of the left axilla and emerged through the pectorals on the right side about two inches to the mesial side of the anterior fold of the right axilla. In the left axilla there is an expansile swelling as large as a hen's egg. There is little loss of sensation in any part of the arm. There is complete wrist drop and inability to flex and to separate the fingers. Voluntary power in the triceps—the supinator longus and extensors of wrist and fingers do not react to faradism, and but slowly to galvanism—reaction is more easily obtained by the anodal than by the cathodal closing current. (ACC$\overset{>}{-}$CCC). The muscles of the median and ulnar distribution show marked weakness, and voluntary power is all but lost—react promptly to galvanism.

27–4–16. Operation. (a) Ligation of first part of axillary artery. (b) Eight inch incision over line of the vessel. Axillary border of pectoralis major, divided and reflected. All nerves of the plexus lying anterior were found to be closely adherent to the sac and were obviously stretched. Nerves stripped down the sac wall. Sac opened and clot turned out. Sharp hæmorrhage checked. Sac excised with difficulty and vessel tied above and below. The musculo-spiral nerve was found in its position at the back of the sac, and tacked down to it. Scar tissue removed from the nerve which was found constricted and flattened, but on division of the constricting band expanded slightly.

29–5–16. Extensors of wrist and fingers react fairly to galvanism. Voluntary power has returned in median and ulnar distribution. Circulation in arm and hand well compensated.

Invalided to Canada with symptoms of musculo-spiral lesion only.

INCOMPLETE LESION OF GREAT SCIATIC NERVE WITH TRAUMATIC NEURITIS CAUSING GREAT PAIN SO THAT PATIENT WAS BEDRIDDEN FOR SEVENTEEN MONTHS—CASE "E."

"E"—Pte. C., Canadian Infantry.

Admitted 27–3–16. History of S.W. lower third of left thigh 25–4–15.

Complains of extreme constant pain in foot and leg ever since being wounded.

Previous Operations:

1. F. B. removed in France.
2. Removal of scar tissue from sciatic nerve. . 2–6–15
3. Ditto. 6–9–15
4. Ditto and nerve wrapped in saphena vein. 29–1–16

In other hospitals

No improvement in the pain followed any of these operations, and patient has never been out of bed, as he cannot bear to have the leg touched, it is so hyperæsthetic. The leg is flexed on to the thigh to 45°, and there is a bad foot drop with contracture of the tendon achillis.

Marked hyperæsthesia to cotton wool stimulation on the sole and on the outer side of the foot.

5. Operation. Division of tendo achillis and forcible extension of the knee with the hope of stretching nerve fibres and diminishing pain. Scar was felt to stretch in the popliteal space.

Slight alleviation of pain for two days, but it recurred.

6. Operation 24–5–16. Removal of scar, freeing nerve and fascial "sleeve". Both popliteal nerves were found surrounded by

large areas of fibrous tissue. Both nerves were freed from scar as much as possible, and this extended for three inches above their junction. The nerves felt hard and fibrous but to such an extent that further treatment seemed contraindicated. Fascial sheaths taken from both thighs six inches by two inches invested both popliteals and the sciatic—like a pair of trousers. All three nerves injected with 5 c.c. normal saline above and below the "sleeve".

Temporary relief was obtained for a week but afterwards recurred.

18–6–16. Pain as before, and foot is œdematous.

4–7–16. As patient continues to lose weight and is very depressed it was decided to sacrifice the sciatic nerve. This on account of the length of time patient has been in bed (15 months) although there is voluntary power in extension of the ankle.

7. Operation. Excision of sciatic nerve at the junction, four inches removed which included repair work of operation No. 6 with fascial covering.

10–7–16. All pain gone, anæsthesia in foot.

19–9–16. Patient invalided to Canada as a walking case, boot and iron to prevent drop foot.

PATHOLOGICAL REPORT ON NERVE SECTION

Microscopically. Several large bundles of nerves separated by much dense—in places hyaline—connective tissue in which are embedded groups of inflammatory cells, and also foci of endothelial cells laden with brown pigment—old hæmorrhage. In all nerve bundles there is considerable destruction of fibrils and their sheaths, often with replacement fibrosis. In parts at the periphery of the section a layer of connective tissue is seen, in some parts separated from, and in other parts attached to, the subjacent connective tissue covering the nerve bundles.

The section shows to what extent interstitial fibrosis may occur when the nerve sheath is damaged.

Conversely it shows the uselessness of dissecting the nerve from surrounding scar when on palpation the nerve feels in the least degree hard or nodular.

The layer of connective tissue referred to above consists of the fascial flap that had been put into position six weeks previously. It shows that the "sleeve" does not unduly adhere to the nerve sheath.

TENDON TRANSPLANTATION IN A CASE WHERE NERVE SUTURE WAS IMPOSSIBLE

"F"—Pte. L., Res. Canadian Battalion.

Admitted 24–12–15. History of having been hit by a bullet in the left groin on 16–11–15. The bullet emerged posteriorly in the region of the left sacroiliac joint.

Wounds closed on admission.

The left thigh markedly atrophic—two inches less in circumference than the right. Cannot extend leg on the thigh, and cannot raise the patella.

The quadriceps muscle does not react to faradism, and only sluggishly to galvanism. Matted glands and adhesions causing a marked mass felt on palpation in left pelvis.

Thomas walking knee splint applied, massage and galvanism.

17–5–16. No voluntary power in quadriceps—no reaction to faradism and only sluggishly to galvanism. Apparently a complete lesion of the anterior crural. Suture contraindicated for anatomical reasons. Tendon transplantation advised.

16–6–16. Operation. Vertical incision twelve inches long on outer side of popliteal space. Biceps isolated and separated from head of fibula. From a corresponding incision on the inner side the semitendinosus was separated from its insertion. A channel was made between the deep fascia and the aponeurosis of the vasti through a four inch vertical incision in the supra patella region. The tendons were brought through this opening to the patella from their respective sides. Each tendon was fixed to the patella by means of a tunneling process which fixed them subpereosteally on the anterior surface. Sutured with No. 3 chromic catgut. Wounds closed.

16–9–16. Walking well—full extension possible voluntarily and 45° flexion of the knee permitted.

26–9–16. Discharged in England.

SYMPOSIUM ON SUPPURATIVE CONDITIONS IN THE LOWER RESPIRATORY TRACT

MEDICAL ASPECTS

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THIS subject embraces not only several structures, but also even a greater variety of disease processes. It will be most convenient to consider the structures and their diseases from above, downwards.

1. Purulent Bronchitis occurs in a more or less marked degree in the final stage of all cases of chronic bronchitis, but there may be marked purulent sputum from the first, a pint or more being expectorated in the twenty-four hours, as if a large cavity or an empyema had ruptured into a bronchus. The pus may become offensive, but the odour soon abates; the odour is less marked than in putrid bronchitis. Purulent bronchitis may become converted into the putrid variety, however, especially if bronchiectasis develops. As a rule the patients lose flesh early, but the course of the malady is usually chronic. West has seen an acute form develop in the course of typhoid fever. The cases were not fatal, the symptoms disappearing with convalescence. These cases will usually be found associated with some other disease, commonly tuberculosis and affections of the heart. Later, usually with diseases of the kidneys.

2. Bronchiectasis. A slight degree of bronchiectasis or bronchiectasia is not rare. It probably occurs in all cases of chronic disease of the lung tissue, but is of no clinical significance.

The *causes* of it are essentially two: first, weakness of the bronchial wall from disease; and second, increased pressure within, as in coughing. In a measure, the same law that applies to the arterial system is true also of the bronchial tract. Aneurism never occurs in a healthy artery, and persistent dilatation of the bronchi probably seldom, if ever, occurs without preëxistent disease of the bronchial wall.

Read before the Canadian Medical Association at the forty-eighth annual meeting, Montreal, June 13th to 15th, 1917.

Symptoms. Cough and profuse expectoration are the constant symptoms of a well-defined bronchiectasis. The sputum is purulent, and usually offensive; in the later stages, always so. The cough is paroxysmal, and is excited by overflow of the secretion into the healthy bronchi due to movement of the body, as in rising from bed. When abundant, the sputum, as a rule, is expelled with ease, usually profuse, and may amount to any quantity up to a pint or more. If very abundant, the secretion may overflow into healthy tubes, and thus, even at rest, give rise to marked coughing. For these reasons the coughing is worst when the bronchial tubes of the lower lobes are diseased. So long as the secretion remains undisturbed in the cavity there is no cough. The sputum separates into two, or more often three, layers or strata on standing. The layers consist of a dense, gray purulent mass at the bottom of the vessel; over it a grayish or greenish, partially translucent portion, and, if there has been much coughing, there is a frothy layer at the top. Blood is present at times, but not frequently. Later in the disease there may be quite copious hæmoptysis. Dyspnœa is slight or absent in ordinary cases.

Physical signs are those of a cavity containing liquid contents, and will, therefore, vary with the quantity of contents present. If these have been recently expelled there will be the usual signs of a cavity communicating with the bronchus. If full, the area will be flat to percussion, and without any breath sounds. In addition, there may be various adventitious sounds. These will depend on the state of the surrounding lung tissue. If this is not consolidated the râles will be soft and rather coarse; if it is fibrosed, they will be high-pitched and crackling. These may be the only signs present.

Fever is absent until late in the disease, when there may be diarrhœa and also albuminuria from amyloid changes in the kidney. In old standing cases there is clubbing of the fingers and osteo-arthropathy in both the forearms and legs.

Diagnosis. In cases with a typical history and characteristic sputum, especially its expulsion in mouthfuls in the morning, diagnosis is usually not difficult, but such cases form the minority. With the advent of the *x*-ray, in cases with signs of a saccular cavity, the localization by stereoscopic plates is usually made with ease. There is often difficulty in excluding tuberculous cavities, abscess of the lung, and circumscribed empyema, or mediastinal and subphrenic abscesses perforating a bronchus. In such circumstances not only the *x*-ray, but also the bronchoscope may be resorted to in solving the problem.

Treatment. In treating bronchiectasis it is necessary to bear in mind that we are dealing with a cavity, or cavities, in which lodges purulent secretion. The first essential in treating a purulent cavity anywhere in the body is to secure prompt and complete drainage. Without this it is impossible to prevent decomposition, and, as drainage is the most effective means in lessening the discharge from any suppurating cavity and rendering it sterile, so it is with bronchiectasis. Our main object, therefore, should be to secure the freest possible emptying of the cavities.

This is as true of a bronchial cavity as of an hepatic or appendix abscess. To secure drainage of the bronchial tract the postural method is the most effective. It is to be noted that bronchiectases of the upper lobe are more easily treated because they drain well, and in them there is little cough, and expectoration is never abundant. Severe coughing is an additional aid to expelling the contents, and it is to this that Chaplin's creosote bath method chiefly owes its efficiency. The inhalation of a creosote spray is a much simpler plan, and probably can accomplish as much good. Aside from these measures medical treatment has little to offer except the general care of the patient. It is futile to attempt to maintain a healthy secretion by antiseptics without drainage of the cavity.

Abscess of the lungs. Causes of acute abscess of the lung are various, the more important being:

1. Pneumonia—lobar, lobular.
2. Inhalation of septic bodies or particles from operation in the mouth, nose or throat, especially tonsillectomy. There has been a great increase in these cases, chiefly in those operated on under general anæsthesia. Great responsibility, therefore, rests upon the throat specialists and dentists.
3. Inhalation of foreign bodies, *e.g.*, tacks, buttons, seeds, etc.
4. Septic emboli.
5. Diseases from which infection extends through the diaphragm.
6. Suppurating hydatid cyst in the lung.
7. Actinomycosis of the lung.
8. Gangrene of the lung.

Symptoms. There is rather high persistent fever during the stage of formation of the abscess, later the fever becomes more septic in its course, often with chills. With the first symptoms, while the condition can only be suspected, an x-ray examination should be made with a careful search for signs of a foreign body, bearing in mind the ease with which it may be overlooked. Often there is no history of inhalation of any such body, even when it is a large one, *e.g.*, a tooth, bean, marble, etc. A bronchoscopic examination is advisable in all cases of uncertainty. In expert hands it can be done quickly and with little distress.

During the early period there may be moderate cough with muco-purulent sputum; if the abscess ruptures into a bronchus, as it usually does, there is sudden copious expectoration of pus, in which lung tissue may be found, the most characteristic sign. The pus may be free from odour at first, but soon becomes fœtid. Pneumococci or streptococci are the most common bacteria present.

Physical Signs. Before the pus discharges, there is dullness; flatness if the abscess is near the surface of the lung. After discharge the signs are those of a cavity with walls of soft pultaceous tissue and containing considerable fluid. If the abscess lies deeply in the lung the signs may be quite indefinite. There is no change in the position of the heart, or in the shape of the chest. The abscess frequently opens into the pleura; it may do so into the pericardium or perforate an intercostal space.

If the abscess remains closed it may be difficult or impossible to differentiate from an encapsuled pleural exudate, especially if interlobar.

X-ray, in frank cases, gives a picture that is suggestive; taken in connexion with the history and symptoms, it may be so significant as to enable a definite diagnosis to be made; with stereoscopic plates the size and exact position of the abscess may be determined.

Prognosis. The prognosis depends on the pathogenesis, its early recognition and the efficiency of drainage.

In single abscess of moderate size, which opens early into a bronchus, and when the pus is discharged fully by coughing, the prognosis is good; as it is also if near the surface, so that it can be effectively drained.

Cases resulting from large foreign bodies in the bronchi run a grave and rapidly fatal course. However, these offer the best prospect of early recognition by *x*-ray examination, and the certainty of removal through the bronchoscope. If discovered early, it is remarkable how rapidly the local signs disappear.

Those of pneumococcal origin are the most favourable. The streptococcal cases are more grave, partly because new foci of infection may occur from time to time, as in the following cases:

Case 1. A. T., a young Englishman. This case ran a very chequered course. He became suddenly ill in April, 1914—general aching pains and, later, inflammation of the base of the left lung. When admitted to the hospital his temperature was high, he was deeply flushed, and his general appearance indicated severe illness. He improved, and ten days after admission there was infection of the right lung between the scapula and spine. This extended, and a week later affected the whole base. By puncture 4 c.c. of a turbid, straw-coloured fluid was obtained from the sixth interspace in the anterior axillary line. It contained short-chained streptococci. A few days later puncture was made below the angle of the scapula and 100 c.c. of a nearly clear fluid was obtained. The needle was pushed further in and a sero-pus flowed. Both fluids showed short-chained streptococci.

Four days later, *i.e.*, May 21st, the evidences of fluid in the anterior part of the base became marked, and 70 c.c. of greenish-yellow pus containing long-chained streptococci were aspirated and 2 c.c. of a 2 per cent. formalin in glycerine solution injected. Four days later one and a half inches were removed from the sixth rib, but no pus was found, showing that the formalin had served the purpose.

Two weeks later pus was obtained from beneath the scapula, probably a collection in the interlobar fissure. Evidences of fluid formation were found below the right clavicle, and on July 2nd he coughed up 250 c.c. of muco-purulent sputum. An *x*-ray showed the evidences of a cavity in this part. Since then this part of the chest has become greatly depressed. Below it, and in the front part of the axillary region, is a large cavity, from which there is continual discharge since, but notwithstanding this his general condition has become satisfactory. He has marked osteoarthropathy in all the limbs. Prolonged vaccine treatment has done much good. The cavity will probably persist unless he agrees to have resection done. Thus far he has refused this.

This case is evidently one of a series of localized empyemas and abscesses of the lung.

Case 2. Mrs. Ryan, aged thirty, had her teeth treated and some extracted in July, 1916. About ten days later she had some cough. It increased, and her temperature rose. There was slight pain below the right clavicle. Her illness was variable for the next six months, during which she coughed and expectorated a great deal. At one time she brought up a brownish mass that she thinks was hard. This, possibly, was a tooth, or part of one, that had been inhaled. She entered the hospital in January, 1917. She was then very ill, temperature being high and the general symptoms quite septic. Below the right clavicle was an area of flatness. Sputum was abundant, purulent and very foul. It separated into the three characteristic layers. The abscess was opened and drained and she improved but her temperature still continued slightly above normal. The pleura and lung below the abscess have evidently become badly infected. The back of the lung is the only part now resonant. Although she is much improved the outlook is not favourable.

Case 3. Circumscribed gangrene of the lung is an occasional cause of abscess. Several years ago such an abscess occurred in a man upwards of sixty years of age. He had had severe uræmic convulsions with persistent deep coma lasting over twenty-four hours. He recovered and was able to go about, although not equal to much business. The gangrene occurred in the left lung, between the second and fifth ribs—the symptoms were characteristic. There was profuse expectoration and in the sputum were many shreds of lung tissue. The general condition improved with the lessening of sputum and cicatrization became complete. Marked retraction of the chest from the clavicle to the fifth rib followed.

These cases usually do well if the chest is opened and the cavity drained—in this case drainage by way of the bronchi was quite effective and the result satisfactory.

PLEURAL CASES. I have not considered pleural infections as coming within the scope of this discussion, except in those cases in which an opening forms into a bronchus, and pus is expectorated.

The cases originating from pleural empyema are relatively common. In many of these the infection is probably of the lung first—a small abscess forming and opening into the pleural cavity. An analogous process occurs in the brain in cases of abscess of the temporal lobe, secondary to disease of the middle ear.

The pleural infection is probably always gradual, giving time for adhesions to form. For this reason, the empyema usually is well circumscribed, often to a very small area difficult to find with the aspirating needle.

If efficiently drained, the outlook is favourable unless the perforated bronchi have dilated. The prognosis will then depend on the curability of the bronchiectasis. Much will depend on early diagnosis and prompt and efficient drainage.

Interlobar empyema may, and not rarely does, lead to perforation of a bronchus, either by ulceration or the formation of secondary abscess of the lung. These cases are often difficult to diagnose. Dependence has to be placed on a history usually milder than that of pneumonia, the seat of dullness over the site of an interlobar fissure, and in many cases, its mobility in respiration. This was so in:

Case 4. Babe, in Toronto General Hospital, had interlobar empyema between the middle and lower lobes. It was circumscribed, and could be demonstrated to move with respiration. It was aspirated—40 c.c. being removed, after which 1 c.c. of 2 per cent formalin in glycerine was injected. The temperature quickly fell to normal, and the babe soon became well.

It may here be interesting to point out that localized empyema does not necessarily call for surgical aid. If the cavity is circumscribed, and can be esaily aspirated, and then 2 or 3 c.c. of a solution of formalin in glycerine injected into it, the cavity is usually completely sterilized and complete recovery follows. I have had a case of subphrenic abscess so treated, with complete recovery.

Many pleural cases are secondary to suppurative diseases below the diaphragm, especially of the appendix. The outlook will then depend chiefly on the abdominal disease.

Case. 5. A man, aged between forty and fifty years, had a definite history of appendix abscess which was not drained. He was ill for some weeks, but going about. After a few weeks pain occurred over the liver and later in the lower part of the axilla. He soon began to cough, at first with little sputum, which gradually increased, with later sudden expectoration of copious foul offensive pus, with fæcal odour. This was his condition when first seen. Over the upper part of the rectus muscle, and somewhat to the right, was tense, dull and tender, also in the ilia fossa. In the lower part of the axilla was a round, fluctuating swelling about 5 cm. in diameter. It enlarged and became tense in coughing. There was evidently an abscess communicating with a bronchus which had also perforated the intercostal space. It was opened at once to give vent to pus and arrest cough and sputum, and he was sent to the hospital. An opening in the right iliac area gave vent to a large quantity of offensive pus. A wide irregular sinus was traced up behind the right rectus, over the liver, and onwards out through the opening made in the right axilla.

He progressed favourably for a few days and then suddenly collapsed and died; probably from a perforation with peritoneal cavity. An autopsy was not permitted.

Case 6. Another case, secondary to appendix disease, was that of a young man in whom pylephlebitis occurred with multiple abscesses of the liver. A small subphrenic abscess formed, infecting the pleura, causing an encysted empyema and later the lung became infected, with the formation of a small abscess which opened into a bronchus. An effort was made to aspirate the empyema, the needle being introduced in several places, but the cavity was so small that it was not found.

At autopsy these conditions were proved to have existed.

Case 7. Another case was that of G. H., an undergraduate, who had pneumonia of the base of the left lung, followed by empyema which increased rapidly. He suddenly began to cough up pus. Drainage was at once done, with relief. Convalescence was slow, but apparently complete, and the sinus closed. Within a couple of weeks it re-opened and discharged two or three ounces of pus. It was then filled with bismuth paste and healed again. The introduction of fluid was not permissible owing to a communication with the bronchus. It has since healed and re-opened. Evidently, there is a bronchial sinus which prevents the complete cure. No doubt in this case there was an abscess of the lung which had ruptured into the pleural cavity, causing the rapid marked empyema. It is quite probable that the bronchus is dilated, and complete recovery may call for the destruction of this portion of the bronchiectasis. He is reluctant to have this done.

Conclusions. Important considerations in the treatment of all these respiratory diseases are:

1. The fullest possible drainage of all cavities, including the bronchi, if one can speak of draining tubes.
2. The rendering of the secretion as aseptic as possible.
3. The promotion of the general health, and
4. The use of appropriate vaccines, preferably autogenous ones.

SYMPOSIUM ON SUPPURATIVE CONDITIONS IN THE LOWER RESPIRATORY TRACT

SURGICAL ASPECTS

By E. M. von Eberts, M.D.

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IN the limited time at my disposal I can at the most but touch upon the salient points in the surgical treatment of the three conditions—bronchiectasis, pulmonary abscess, and empyema; and what I have to say is not in any way original, but simply an attempt to present in a concise way contemporaneous opinion upon the subject under discussion.

Bronchiectasis. In deciding upon a surgical procedure suitable for the treatment of bronchiectasis, one should discard at once the methods of compression and collapse, namely rib resection, artificial pneumo-thorax, and actual packing of the pleural cavity with gauze, because, while these measures may diminish lung volume to a certain extent, and for a time lessen appreciably the amount of secretion, none of them brings about a sufficient pressure upon the distended air passages to effect more than a temporary improvement. To a simple drainage operation experience gives even less sanction: pneumotomy almost invariably proves fatal. In bronchiectasis, as you know, the cavities are multiple, and do not, as a rule, intercommunicate in so intimate a way that by the drainage of one cavity one may hope to effect the drainage of all. The cases which have been reported as cured by pneumotomy were more probably cases of true lung abscess.

There can be no doubt that in the operative treatment of bronchiectasis the only satisfactory results have followed pneumectomy. This is now an accepted surgical procedure. Only the unilateral basilar type of case, however, is suitable for this radical operation. In other words, possibly only one case in ten, which have been diagnosed as bronchiectasis, should be submitted to pneumectomy.

After preliminary bronchoscopic examination to exclude the

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presence of a foreign body, which might be overlooked in the *x*-ray, pneumectomy should be carried out in two stages, briefly as follows:

Prior to the first stage, the evacuation of the bronchiectatic cavities is promoted by raising the foot of the bed for an hour preceding anæsthesia. Ether by the drop method is to be preferred. The necessary apparatus for tracheobronchial aspiration must be at hand to remove accumulated secretions from the region of the bifurcation, should serious cyanosis develop. The incision, crescentic in form, extends from the fifth rib, two inches from the vertebral column, downward and outward across the eighth rib in the scapular line, and terminates at the sixth rib in the mammary line. In reflecting the skin and muscle flap one should be careful to arrest all bleeding. The seventh, eighth and ninth ribs are then resected subperiosteally from their angles to the anterior axillary line. After ligation and removal of the intercostal muscle-bundles, the first stage is concluded by the replacement and suture of the skin and muscle flap. To promote compression and adhesion-formation, and to aid the expulsion of secretions on coughing, a graded gauze compress is laid over the area of rib resection and held firmly in place by adhesive strapping, after which the regular dressing is applied.

The second stage is undertaken after a lapse of about one week. The original wound is re-opened. The chief difficulty in this stage is the separation of adhesions. If they are very dense, they should be cut. The diaphragmatic attachments of the lower lobe should first be liberated. Difficulties and hæmorrhage may be encountered in the process of separating the lobes. Adhesions to the pericardium are least likely to give trouble. If acute respiratory disturbances should develop at this point, the flap should be replaced, and firm pressure exerted upon its outer surface. If there is no subsequent improvement in respiration, or if the hæmorrhage is excessive, one should not go on with the operation, but prolong it into a third stage. Provided, however, that all goes well after the separation of the adhesions, one may complete the operation by applying a curved clamp firmly to the lobe root and amputating the lobe half an inch distal to the clamp. The veins, arteries, and bronchi are ligated separately with chromic gut, and then a mass ligature of silk or kangaroo tendon is placed in the path of the clamp as this is slowly released. While invariably there is leakage from the bronchial stump, the small fistulous openings which appear in no way complicate or delay the convalescence, and may be closed later by plastic methods under local anæsthesia. A pack is placed in position at the close of the operation.

On the fourth day the pack is removed, and a fresh one carefully inserted. Irrigation and the use of tubes are never indicated. In the final stages of healing and cavity obliteration, granulation is stimulated by balsam of Peru. Complete closure may be hoped for within four months.

Pulmonary Abscess. The results of the surgical treatment of pulmonary abscess are either brilliant or disastrous. Those in the latter category might be largely eliminated if one could always count upon the obliteration of the pleural cavity. Unfortunately, the pleural cavity is frequently opened, either by misadventure during rib resection or while proceeding in the mistaken belief that it is closed. It is thus advisable to make it a rule to perform the operation of drainage in two stages, making an exception only in those cases where a definitely localized pleural friction has existed in the proposed path of drainage, or where there is found localized tenderness on pressure. To open a pulmonary abcess in the presence of pneumo-thorax is to invite a catastrophe.

The manner of approaching the cavity through the lung tissue varies in the hands of different operators. A director inserted beneath the exploratory needle and followed by narrow forceps is the method which I have employed. The cautery blade may be used. Hæmorrhage is controlled by packing. The drainage tube should have a bevelled extremity and a lateral opening.

If diagnosis and localization are secured by *x*-ray, the aspirating needle should not be employed prior to operation, on account of the danger of hæmorrhage and pyæmia (remarks which apply with equal force to the needling of a bronchiectatic lung).

Empyema. We come now to the question of the surgical treatment of empyema, which on account of its frequency is the most important disease of the group under consideration. This condition is best considered under the headings of "acute" and "chronic".

Acute empyema. The acute empyema which is associated with or follows pneumonia is the most common type, and the methods applicable in the treatment of such cases may, as a rule, with slight modification, be made applicable to all.

In dismissing repeated aspiration as an inadequate method of treatment in metapneumonic empyemata, I would cite the experience of Borelius. In twelve cases treated with primary thoracentesis and secondary thoracotomy, the average duration of treatment was one hundred and seven days, whereas in seventeen cases treated by primary thoracotomy the average duration of treatment was only fifty-two days. Undoubtedly cases may be cured by repeated thoracentesis, cases in which the effusion is but slightly purulent and massive fibrinous exudate is absent. These cases nearly always occur in children. Preliminary thoracentesis, however, to relieve pressure, diminish absorption, and promote reëxpansion, is unquestionably a desirable practice.

Simple thoracotomy has had, and still has, many ardent advocates, but few who have had extensive hospital experience will maintain that simple intercostal drainage is efficient in the majority of cases. Without a fairly large incision and the use of the rib spreader, digital exploration and the evacuation of large masses of exudate are out of the question.

My own experience has confirmed me in the belief that the most satisfactory method is resection, under local anæsthesia, of a portion of the ninth or tenth rib, and the employment of negative tension drainage after the removal of all coagulum, either digitally or with the aid of a gall-stone scoop.

Methods of drainage having as their object the partial or complete restoration of the normal intrathoracic tension (methods essentially physiological in their bearing) date from the intercostal siphon drain of Buelau in 1891. Perthes recorded an advance upon this method in suggesting continuous aspiration after rib resection. Hutton in 1898, Baylor in 1899, and Williams in 1900, devised valvular mechanisms which permitted the escape of pus and air during forced expiration or coughing, but which, to a much greater extent than the simple pus-soaked dressing, prevented the ingress of atmospheric air.

My knowledge of the value of negative tension drainage in the treatment of acute empyema has been gained with the use of the apparatus here shown, and I am satisfied that the results obtained have justified the presentation of this method by Dr. Hill and myself in 1911. The technique of the operation is very simple. The dressings require time and careful supervision. The use of suction is continued as long as there is evidence of tidal air. Since the introduction of this method in my own clinic, it has not been necessary in any case of acute empyema to perform subsequently an extensive rib resection for the obliteration of a residual cavity.

Chronic empyema. In chronic empyema, especially in chronic unopened empyema, and even in chronic cases in young subjects in whom drainage has been previously employed or rupture has been spontaneous, this method of negative tension drainage has been found most efficacious.

In those cases of chronic empyema in which there is a discharging sinus and a residual collection of pus, varying from one ounce to a pint or more, efforts must be first directed towards securing free and dependent drainage, in order to rid the patient of toxæmia and to restore a standard of health which will permit of more radical operation. This will probably require a month or six weeks. Definite information as to the position and extent of the cavity should then be secured by means of the *x*-ray. The safest method of outlining the cavity is to tampon it with gauze soaked in an aqueous suspension of barium sulphate.

The decortication operation of Fowler and Delorme and the discission operation of Ransohoff find many advocates, but these operations are frequently only partially successful. The method of Estlander or of Willms may be found sufficiently radical in certain cases. Even the mutilating procedure of Schede may fail to secure sufficient chest-wall collapse to obliterate the cavity. The most rational of the extensive operations is that described by Robinson of the Mayo clinic—an operation in which muscle-filling plays a large part in the obliteration of the cavity, leaving a large but exposed area to heal by granulation and the ingrowth of skin.

No one method can be singled out as the method of choice, because treatment must vary with different cases. In one case one might have to use several methods of treatment in succession. For instance, there might be a primary decortication, followed at the end of a couple of months by an Estlander or Willms operation and still later by a local muscle-filling operation, and finally the use of Beck's paste for the obliteration of a persistent sinus. Any or all of the procedures which have been mentioned may be suited to particular cases, and a knowledge of them all is therefore essential.

SUPPURATIVE CONDITIONS OF THE LOWER RESPIRATORY TRACT

ROENTGENOLOGICAL ASPECTS

By W. A. Wilkins, M.D.

Roentgenologist, Montreal General Hospital; Demonstrator of Roentgenology, McGill University; Consulting Roentgenologist, Gray Nuns Convalescent Home.

IN many ways the chest is a most favourable region for *x*-ray examination. The obstruction to the passage of the rays offered by the air-containing lungs is very slight, and accordingly contrasts with the denser tissues are marked. Not only is one able to obtain a wealth of detail on the plate, but he is able to utilize to the very greatest advantage the fluoroscopic examination. With the perfection of apparatus, improvement in technique, and especially since the introduction of the Coolidge tube, the hurried and frequently incomplete examination of earlier days is eliminated. In fact the screen examination of to-day is a leisurely proceeding; often the most important part of the examination, the value of which will depend upon the sharpness of the observer's eyes to see and upon his ability to recognize and interpret what he sees.

Nearly all chests upon close scrutiny will show some degree of pathology, in estimating the importance of which the patients' age and habits of living must be taken into consideration. In the majority of cases without symptoms this pathogloy is so slight as to warrant no further concern. In suppurative lesions of the lower respiratory tract—as the name implies—one has to deal with the presence of pus. The shadow of pus naturally will be the same whether the condition is due to emypema, pyo-pneumothorax or to any other suppurative lesion, accordingly, factors other than the mere shadow of pus must be considered in the differential diagnosis. Fortunately each condition has special features which aid.

To interpret the shadow rationally one must make use of his knowledge of pathology and of the clinical history. It is necessary

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to know the pathology in order to appreciate the different elements which influence the production of the shadow picture. One must constantly keep before him a mental picture of the condition present within the chest which is casting the shadow, and the plates must be studied with an extremely analytical eye. An error of interpretation is not the fault of the *x*-ray, but rather the fault of some one trying to read into the plates something which he could not see, or something which he thought he saw. The clinical history is best obtained by working in collaboration with the internist. The most favourable opportunity for this is to see the case together at the fluoroscopic examination, and to consult over the plates. To this consultation each brings whatever special knowledge he may possess. The final verdict or summing up must rest with the clinician.

Before proceeding to the differential diagnosis, I will mention briefly the all-important *x*-ray technique. In chest work especially, the *x*-ray examination is a great deal more than mere picture-making. The fluoroscopic examination is most important. Besides assisting in localizing, it is possible amongst other things to obtain an idea of the dynamics of the case, which is not possible with the plate, as it records static conditions only. The waves produced by shaking the patient or by the pulsations of the heart can be readily seen in pyo-pneumo-thorax or in large abscess cavities. An accurate idea of the size and situation of the lesion can be made out, as in abscess. When stereoscopic fluoroscopy is perfected, the value of the fluoroscopic examination will be inestimable. Concerning the plate method, stereoscopic plates are of value not only in diagnosis but also in localizing and one is enabled to study the plates at leisure. The single plate may be sufficient to establish the diagnosis in many cases but conveys no information concerning the exact situation of the lesion.

With regard to the distinguishing features of the more important of the suppurative lesions of the lower respiratory tract, the following may be said. It has been my experience that bronchiectasis frequently presents difficulty of recognition with a degree of certainty, and the clinician is as frequently undecided between it and abscess. At the *x*-ray examination, in spite of the great difference in pathology the indecision may remain in certain cases. Clinically the case may simulate abscess, the odour of the breath may be pronounced and the *x*-ray examination may suggest small multiple abscesses. If the condition is marked, and the examination has been satisfactory, little difficulty will be experienced, the shadows of the dilated bronchi with thickened walls, generally filled with secretion, being characteristic of no other condition. These are seen on the plate both longitudinally and on cross section. The appearance will vary, depending upon whether or not the bronchi contain secretion. If empty, the large white circles of the thickened walls on cross section and the tubular appearance longitudinally will be seen. If containing secretion, the clear appearance of air will be replaced by a misty shadow.

Empyema, if extensive, presents the same general appearance as pleurisy with effusion, although the shadow is usually denser. If small, as is more frequently the case, it may require to be distinguished from abscess. Its situation at the base, its greater or less irregularity of outline due to adhesions, and its more uniform density, are points in favour of empyema. Interlobar pleurisy or empyema may lead to great difficulty in diagnosis, but the situation and shape as determined fluoroscopically or by means of steroscopic plates are generally sufficient to avoid error.

In pyo-pneumo-thorax the *x*-ray picture is distinctive. The collapsed lung, the brilliant air-containing pleural cavity and the dense shadow of pus with a level top is diagnostic. In whatever position the patient may assume, the upper level of the pus will remain parallel to the earth's surface. No condition is more striking nor easier of diagnosis than a well marked case of pyo-pneumo-thorax. Fluoroscopically, waves may be produced by shaking the patient or by the pulsations of the heart.

In abscess of the lung, the picture will vary depending upon the conditions present at the examination, or with the technique employed. The vertical position is the only one to be relied upon with any degree of certainty, but at times the very serious condition of the patient may prevent this posture. A tilting table permits of posturing the patient in a position such that if not vertical it is at least not horizontal, and whatever air may be present in the cavity will collect at the highest point and the secretion below with a horizontal upper limit. If the cavity is full at the *x*-ray examination, the abscess will appear as an area of increased density generally in the midst of pathological lung tissue; if empty of secretion it will appear brilliant owing to the air contained therein. If both air and secretion are present, the appearance will vary depending upon whether the patient is viewed in the horizontal or in the vertical position. If in the horizontal position, it will appear as more or less mottled; if in the vertical, the characteristic appearance of "air above and pus below" will be present.

In the above, I have endeavoured to bring before you a few of the features associated with the *x*-ray findings in suppurative lesions of the lower respiratory tract, and to illustrate same with lantern slides. This group is composed of conditions, any one of which would furnish sufficient material for separate consideration. In fact, abscess of the lung has been so treated by me before the *x*-ray section of this meeting, and accordingly some of my remarks here are a repetition of what I have already said before that section.

THE following information is taken from the forty-sixth annual report of the vital statistics of Ontario for the year 1915. The estimated population of the province was 2,767,350. The number of births registered was 67,032, the males numbering 34,701 and the females 32,331. The illegitimate births were 1,472. The marriages numbered 23,506 as compared with 24,245 during the previous year. The deaths were 33,294 as compared with 32,440 in 1914. Among the causes of death were: Organic heart disease in 2,835 cases; tuberculosis in 2,466 cases; pneumonia in 2,352 cases; cancer in 1,982 cases; apoplexy in 1,418 cases; diseases of the arteries in 1,242 cases; infantile diarrhœa in 1,189 cases; Bright's disease in 1,117 cases; broncho-pneumonia in 662 cases; and paralysis, without specified cause, in 527 cases. The death rate from tuberculosis was eighty-nine per hundred thousand of population, which is an increase of four over that of the two preceding years.

A REPLY to the letter published in our last issue over the signature of Dr. J. W. S. McCullough, Chief Officer of Health, of Toronto, has been received from the Synthetic Drug Company, of that city. It is a matter of regret that this reply has been received too late to be considered in this issue. It will, however, be dealt with in the December number.

Editorial

THE CANADIAN MEDICAL PROFESSION AND THE WAR

THE administration of the medical side of the war by the Government and the Militia Department has already provoked comment in these pages. We would call the attention of our readers to the eminently practical remarks made in this connexion by Dr. D. J. Gibb Wishart in his Presidential Address before the Academy of Medicine of Toronto, published in this issue. In this he points out the need for systematic mobilization of medical forces under the direction of competent medical authorities, and adduces the example of the United States, where immediately upon the declaration of war the acknowledged leaders of medicine were summoned to Washington to consult upon the most scientific way in which the trained profession could be utilized.

The questions raised by the passage of the Military Service Act, first as to the number of army surgeons the profession of this country can legitimately supply, and secondly, whether students entered upon their course of medical study should be liable to the draft, are pointed out to be of vital interest and importance to the whole community. They require for their right solution the intelligent coöperation and advice of the leaders of the profession, and especially of those men who have returned with experience gained overseas. Medical attendance must be provided both for the people at home and for their sons at the front. A continuous supply of students must be provided to fill our ranks, which are being so speedily depleted by death and by enlistment. Above all, the waste of energy and capacity that takes place when men of high professional training, who are meeting high professional responsibilities at home, are sent without discrimination to fill military posts of much narrower usefulness, instead of to the more specialized work that awaits them either here or abroad, should be avoided. It is not too late yet, Dr. Wishart reminds us, for the Government to summon "intelligence" to its aid.

The profession who have carried on the teaching of medicine continuously for nineteen months, as was done at several Canadian universities, in order to secure a sufficient supply of young physicians for the army services, have as truly laboured for the cause of the Allies as has any officer who goes to the front or any business man who remains at home to direct the supply of munitions, but the Government has not borne one dollar of the expense; nor has it distributed any honours, nor even uttered one word of thanks.

The Staffs of the Hospitals have cheerfully assisted many of their number to get away overseas and have "carried on", doing their own work as well as that of their absent confrères. There is not a Hospital in Canada to-day that is not understaffed, and in addition much unremunerated work for returned soldiers is being performed and upon men who in ordinary times would be paying fees to those who now contribute their labour without price.

The burden is falling upon the few rather than upon the many, and the time is come when the profession has the right to look to the Authorities at Ottawa to mobilize the whole profession; to assign those who, by virtue of their age and experience are suitable, to the chief posts of responsibility; to order overseas all those under thirty-five without families to support; and generally to distribute the profession so as to equalize the strain and meet evenly the needs of the public. Men who are handling large public clinics, or engaged in important teaching posts should not be dragged away to less important duties. A strong committee of leaders in medicine, not politicians, should be at once summoned to assist the Surgeon General to distribute the tasks among the profession—this committee should be nominated by the

Dominion and Provincial Medical Authorities and by the University Medical Faculties and thus be truly representative.

There are three demands which our profession makes —of the authorities at Ottawa.

1. A seat upon the militia council, for the Surgeon General.

2. The appointment of a permanent Surgeon General whom the profession can trust and respect.

3. The appointment of an Advisory Committee to the Surgeon General of leaders of the profession nominated by the Dominion and Provincial Medical Associations and by the Universities.

There need be no clashing with the regular C.A.M.C., for the new men would hold temporary appointments only; and for the purposes of the object which is sought, receive the temporary rank which the position to be occupied demands.

REVERE OSLER

IT is with deep regret that we learn of the sad bereavement suffered by Sir William Osler through the death in action of his only son, at the same time his only child. Second-Lieutenant Edward Revere Osler, R.F.A., died in France at the age of twenty-one years, on August 30th last, of wounds in the chest and abdomen, inflicted twenty-four hours previously when, with seven other men of his battery, he was at work in the open, preparing to remove the guns. A stray shell exploded in their midst, wounding all. At the casualty clearing station to which he was taken, he was recognized as his father's son, and Dr. Harvey Cushing, of Boston, Dr. Crile, of Cleveland, and Dr. Brewer, of New York, were summoned from near-by American stations and gave him all the alleviation that skill and loving hands could render.

Revere Osler was a commoner of Christ Church, Oxford. He joined the McGill Hospital on its arrival in England and served for eight months with it in France as assistant quartermaster with the rank of captain, and was there much beloved. He left it for more active service in the British Royal Field Artillery.

It is reported that on account of the increasing frequency of the German air raids, the Canadian hospitals at Ramsgate have been evacuated and the patients distributed temporarily to other hospitals. For some months the danger from air raids both at Ramsgate and Broadstairs, situated as they are on a part of the coast easily accessible to the German machines, has been growing and the effect of explosions upon patients suffering from shell shock has sometimes been disastrous, as can easily be imagined. It is unfortunate that institutions so carefully organized and so well equipped as, for instance, the Granville Canadian Special Hospital and the Officers' Hospital, recently opened at Broadstairs, should have to be abandoned, but it will assuredly be relief both to patients and staff, to get to a safer place and to be relieved of the feeling that the building may be struck by a bomb at any moment.

In the introduction to the first number of *Recalled to Life*, which appeared in June, the purpose of the publication is stated as being an attempt "to diffuse as widely as possible among those who are in any way concerned with the welfare of our sailors and soldiers returned disabled from the war, and not less among such sailors and soldiers themselves, knowledge as to the means by which they may be restored, as nearly as the nature of their injuries permits, to full participation in, and full enjoyment of the activities of civil life"; and "to present something like a complete map of the field (of activity open to the disabled soldier and the training necessary to fit him to take advantage of opportunities) and thereafter a continuous and inspiring record of the work that is being done in it".

The number opens with an article on the Treatment of the Disabled, from the pen of Sir Alfred Keogh, in which is given a preliminary survey of the organization which has been set up for the care, reëducation and return to civil life of the wounded and disabled in Great Britain. A general account of the responsibility assumed by the State and the provision made for the treatment, training and after-care of disabled soldiers and sailors is given in an address delivered before the Inter-Allied Conference at Paris, by Sir Arthur Griffith-Boscawen, parliamentary secretary to the Ministry of Pensions, and an able and comprehensive article on Orthopædic surgery in its relation to the war is contributed by Sir Robert Jones. Under the head of Pensions, Captain Basil Williams gives an historical summary, an account of the present status of pensions, a report of the arrangements for the care of disabled soldiers and the treatment of special forms of disability. A report of work in France and Germany, which was prepared by the Intelligence Department of the Local Government Board, London, and which is also contained in this number, contains much interesting information and gives some idea of the magnitude of the task of providing for the disabled.

A METHOD, reported in the *British Medical Journal*, was recently described before the Royal Society, by Drs. C. H. Browing and S. Russ, by which it is possible to determine what portion of the ultra-violet spectrum is most effective in germicidal action and to specify the wave length of the radiation at which such action practically ceases. The method consisted in exposing a thin film of organism spread on a nutrient surface, such as gelatine or agar, to the spectrum from a tungsten arc. The image of the slit of the quartz spectrometer used produced a permanent effect upon the bacterial film over a certain range of wave lengths. This germicidal action became apparent on incubation at 37° C, subsequent to the exposure; a copious growth occurred except in those regions where the organisms had been killed. Records of such action were obtained which resembled a photograph of the spectral lines. The method has been applied to test the range of susceptibility of a number of different pathogenic organisms. It was possible to expose cultures of two different organisms simultaneously to the same intensity and character of radiation. The ranges of susceptibility of *B. typhosus* and *B. coli* were closely similar and practically the same as those of other organisms such as staphylococcus pyogenes aureus and the meningococcus. A striking feature of the germicidal action of the radiation in question was its abrupt termination at a wave length of about 2960 A U. It has been found possible to correlate this feature with "selective absorption", for it was found that the organisms exhibited marked absorptive power for just those rays which have germicidal action.

It is encouraging to learn that out of one hundred and twelve soldiers who had been discharged from various hospitals as totally disabled and admitted to the Star and Garter Home at Richmond, England, eighteen have left the hospital "improved" and five others have shown such marked improvement that they were able to walk out of the hospital without assistance. This hospital is intended to be a permanent home for disabled and helpless soldiers and sailors who are unable to obtain in their own homes the skilled nursing and attention they require.

The National Committee for Mental Hygiene has been authorized by the Surgeon-General of the United States Army to organize and equip neuro-psychiatric hospital units to be attached to base and other military hospitals. A mental hygiene war work committee has been appointed by the National Committee and a report has been submitted by the sub-committee on clinical methods and standardization of examinations and reports. This report represents the first attempt ever made, in organizing an army, to take into consideration the neuro-psychiatric qualifications of men. It has been drawn up with a view to assisting the medical examining officer to recognize certain forms of nervous and mental disease which would unfit the individual for active service, as experience has shown that such men are not able to withstand the rigours of modern warfare. Particular importance is attached to early symptoms and to those diseases which have no very obvious symptoms but which, nevertheless, can be diagnosed relatively easily and with considerable certainty.

It is suggested that the work of the psychiatrists assigned to the various military camps might be greatly expedited if camp surgeons and line officers would bear in mind certain fundamental facts and would pick out those individuals who were likely to require neuro-psychiatric examination. For instance, all men suffering from syphilis or hyperthyroidism should be referred to the psychiatrist for further examination, as should those exhibiting such traits as irritability, desire for seclusion, sulkiness, depression, shyness, timidity, sleeplessness, over-boisterousness, persistent tendency to violate discipline, dullness, stupidity, marked emotional reaction such as vomiting and fainting at bayonet drill, peculiarities of attitude, speech or behaviour sufficiently marked to attract attention of associates, suspicion, slovenliness in dress, difficulty in executing muscular movements; "queer sticks", cranks, sleep walkers, bed wetters, and butts of practical jokes.

The report concludes with the expression of opinion that the psychiatric examination of recruits would be much expedited if permission were granted to the psychiatrists in the various camps to train and utilize hospital sergeants and others who might be chosen by them to make group examinations of recruits for the following conditions,—pupillary changes, absent or increased knee jerks, station and gait disorders, marked tremors when fingers are extended, facial tremor on showing teeth; and that all men exhibiting any of these symptoms should be referred to the psychiatrist for more intensive examination.

Miscellany

Book Reviews

MATERIA MEDICA AND PRESCRIPTION WRITING. By OSCAR W. BETHEA, M.D., Ph.G., F.C.S., assistant professor of materia medica and instructor in prescription writing, Tulane University of Louisiana. Second revised edition; 517 pages. Price $4.50 net. Publishers: F. A. Davis Company, 1914 Cherry Street, Philadelphia, 1917.

In Part I of this book we find the usual list of drugs described briefly, space being given to preparations, doses, therapeutic action, uses and methods of administration. The arrangement is excellent. Many of the drugs mentioned, however, might have been omitted without seriously affecting the value of the work.

The arrangement of Part II is good, the first half being devoted to general information on prescription writing, metiology, incompatibility, etc., while the second half takes up particular prescriptions selected to illustrate common errors of prescription writing.

FRACTURES OF THE LOWER EXTREMITY OR BASE OF THE RADIUS. By LEWIS S. PILCHER, A.M., M.D., LL.D., consulting surgeon, Bushwick, Jewish, St. John's and Bethany Deaconess Hospitals. 132 illustrations. Price $2.00. Publishers: J. B. Lippincott Company, Philadelphia, London and Montreal. 1917.

In Dr. Pilcher's books we have a very excellent exposition of the fractures of the lower extremity of the radius, based upon long experience and very careful study. One can hardly imagine a more useful book for the interne and the general practitioner, who still, unfortunately, so frequently mishandle these cases; and the experienced surgeon also can well find in the book much that he may have forgotten, and some things that he never knew. The illustrations deserve a particular word of commendation. In the 116 pages there are 132 illustrations composed about equally of skiagrams and drawings. The anatomy of the part, the mechanism of the fracture, the diagnosis and the treatment based on these, are all concisely yet thoroughly set down.

The book is heartily to be recommended.

A Practical Treatise on Fractures and Dislocations. By Lewis A. Stimson, B.A., M.D., LL.D., professor of surgery in Cornell University Medical College, New York. Eighth edition, revised and enlarged. 933 pages with 475 illustrations. Publishers; Lea & Febiger, New York and Philadelphia, 1917.

Dr. Stimson's well-known work appears in its eighth edition. It is unnecessary to repeat the commendation which has always greeted the publication of previous editions. On the whole it is probably the best general work we have in English on this subject. What distinguishes it from other books on fractures is the extremely good bibliography scattered through the text. The student who desires to dig a little deeper into any particular aspect of fractures or dislocations is afforded a reliable guide to original articles, and is helped in addition by the independent criticisms and extensive knowledge coming from Dr. Stimson's very large personal experience.

The book is quite up-to-date. In few subjects have the advances made in the last two or three years been so marked as in the treatment of fractures. This, at least, we have got out of the war. Dr. Stimson during two visits to France, was able to observe the various forms of treatment of gunshot wounds of the bones, and he has introduced in the present edition, as far as possible, the results of these new observations. He illustrates, for instance, the Blake splint for fractures of the femur, as used in the American Ambulance in Paris. One might remark, however, that it would have been well to describe and illustrate with some fullness the methods of Major Sinclair at Boulogne, which represent, in the writer's opinion, a still better method of treating compound fractures of the leg. In general there is perhaps insufficient mention of the work of the English school, which has in the last three years been so prominent in the development of the treatment of gunshot fractures.

The book is to be recommended most heartily to the student and practitioner, and also to the surgeon.

Books Received

THE following books have been received and the courtesy of the publishers in sending them is duly acknowledged. Reviews will be made from time to time of books selected from those which have been received.

CONGENITAL WORD-BLINDNESS. By JAMES HINSHELWOOD, M.A., M.D., F.R.C.P.S., late surgeon to the Glasgow Eye Infirmary. Price 4s. net. Publishers: H. K. Lewis & Co., 136 Gower Street, London, W.C., 1917.

DANGERS IN NECK-WEAR. By WALTER G. WALFORD, M.D. Price 4s. Publishers: H. K. Lewis & Co., 136 Gower Street, London, W.C., 1917.

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Practical Materia Medica and Prescription Writing. By Oscar W. Bethea, M.D., Ph.G., F.C.S., assistant professor of materia medica and instructor in prescription writing, Tulane University of Louisiana. Second revised edition. 517 pages. Price $4.50 net. Publishers: F. A. Davis Company, 1914 Cherry Street, Philadelphia, 1917.

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Res Judicandæ

ARTHROPOD PARASITES SUGGESTED AS A FACTOR IN THE ÆTIOLOGY OF SOLDIER'S HEART AND ALLIED WAR DISEASES

By Anne Young, M.D., D.P.H. (Penn.), D.T.M. (Harvard)

SOME days ago it was my privilege to read an editorial in the issue of this Journal of July, 1916, on "Soldier's heart".

The variance of the views upon its ætiology there recorded, and the idea put forward by most observers that an underlying toxæmia is at work in almost all of the cases, together with the fact that the symptoms of this condition resemble to my mind so closely those resulting from bites of animals and insects known to be venomous, that the question has presented itself to me, whether there is any possibility that "soldier's heart" could have an ætiological relation to the products of the vermin encountered by the soldiers in the trenches and battle fronts of Europe. Bacterial, or chemical toxin, and over-exertion have been put forth as possible predisposing or determining causative factors, but the possibility of an animal venom has not, so far as I know, been considered. The effect of a few lice probably could not produce results appreciable to the individual or attending physician, but is there not a possibility that the harmless few when multiplied by many might produce disturbances such as those classed as "soldier's heart",[1] which have occurred, not only in this war, but in the Civil War of the United States,[2] both of which are notorious by reason of their vermin?

War nephritis stands in a similar class in so far as geographical distribution is concerned, making its first appearance during the American Civil War and producing its highest case record from March, 1862, to March, 1863.[3] In that war the Confederate troops made a sudden advance northward, then retreated, after which they settled down to prolonged trench warfare producing conditions comparable to those in Europe to-day.

Every practising physician has seen cases of enlarged cervical glands due to the presence of pediculus capitis, a condition which always suggests a systemic poison. May it not be that during the act of piercing the skin and sucking, the louse deposits a portion of its salivary secretion in the tissue? Again pediculosis pubis is often associated with steel grey lesions on the sides of abdomen, thorax, and inner sides of arms and thighs. The louse injects the pigment while feeding. Similar lesions have been experimentally produced by inoculating the crushed louse. Not all infested persons show the pigmentation, a point suggestive of a special predisposition.

The louse is only one member of a large class of animals under our consideration—whose mouth parts are specialized either to bite or suck, or fitted both to bite and suck. The bed bug injects an irritating fluid in order to increase the flow of blood to the part. The wood tick is sometimes parasitic to man, causing an itchy, painful urticarial lesion. The bird mites, fowl mites, chicken lice may also become parasitic on man and escape observation because they resemble grains of sand. The mite of scabies needs no specification. Pediculoides ventricosus is found in straw (on which our men frequently sleep) and grain, and causes straw itch or grain itch. This little animal requires a magnifying lens of moderate power to detect it. Contrary to the habit of the mite of scabies, it does not burrow in the skin but pierces for the purpose of securing nourishment, at the same time introducing a venom as a result of which there may be a local eruption of erythema, urticaria, or vesico-papules, in addition to a slight fever, moderate leucocytosis, slight albuminuria and often eosinophilia following an infestment. The sand flea is capable of producing an adenitis. The hairs from the "brown tail" moth, its cocoon and caterpillar, in susceptible persons, produces a dermatitis accompanied with symptoms pointing to a systemic infection. Its barbed hairs can be transmitted to the body by the handling of vegetables or plants or from infested clothing. Dr. Tyzzer[4] has demonstrated that the irritating substance is introduced in the hairs and produces a change in the red blood cells.

We think of insects chiefly as being dangerous in so far as they introduce protozoa or carry bacteria, but animals frequently become diseased as a result of the biting and sucking of insects and allied animals. In the same way do massive trees suffer and die. From Africa we learn that great forest animals die from the bites of locusts. It is a proven fact that size has little to do with the virulence of a venom. A young cobra just escaping from its egg has a venom as virulent as its mother's. The fact is well known that some persons suffer intensely from mosquito bite even to the general impairment of health, accompanied with marked local reaction; others respond similarly to bed bug bites. In India we have a fever referred to as sand fly fever.

For information regarding the constituents of venoms, their effects on the various tissues and organs of the human subject, we are thrown back largely to the many valuable studies[5, 6], made of snake venoms and those of a few of the smaller animals. The studies made on venomous animals have brought out the fact that their venoms are nothing more than digestive secretions, not for defense, but for digestion. In some cases, before ingesting the prey the digestive fluid is introduced into the prospective meal and given time to act; in other cases the prey is swallowed before the venom acts. The hookworm introduces a secretion which prevents the clotting of blood and probably all the metazoan parasites act through a digestive product. Snakes are known to swallow birds and digest them so that no trace of bone or feather is found in the intestines or fæces. The warming of a small South American frog causes it to send forth an exudate which rubbed on the arrow of the Indian furnishes him with one type of poisoned arrow.

Sponge-divers' malady, with systemic symptoms as well as local effects, follows contact with sea anemone. Certain spider bites cause sensations of pain with swelling and muscular contractions. Such spiders have killed milch cows. A dry extract of lactrodectus injected into dog or cat causes death with phenomena of dyspnœa, convulsions, progressive paralysis of respiration and heart. Young spider eggs are more toxic than adult eggs. Scorpions, myriopods, insects and bees all produce a neurotoxin.

The study of venoms has resulted in a broad classification. They all fall into one or two possible classes, namely, those with a specific action on nervous tissue and those with a specific action on blood and blood containers and lymph vessels. The most recent investigations show that many of the snake venoms contain both neurotoxins and hæmotoxins.

If in the case of "soldier's heart" an animal venom is at fault, analogous to those already investigated, we may thus expect to find it operating through the nervous tissue or through the blood system.

The battle front is a grassless, shrubless, treeless land! There must be seasons when myriads of adult insects and larvæ swarm from the ground to find no vegetation from which to suck their life sustaining juice. Is it not conceivable that in the absence of vegetation, except dried tobacco and straw, they seek an animal juice? Again, may it not be that the trench term "vermin" includes many insects, such as grain mites, tree lice, jumping tree lice, fleas, bugs, etc., as well as the myriads of similar animals that feed on decaying vegetable in water. An insect capable of inserting into a tree a toxin sufficient to produce a disease resulting in the tree's death might, in the absence of that tree, turn its attention to man.

The soldier of to-day is clothed with gum boots to the thighs, in rain he wears an oil skin coat; his evaporation is practically nil; for days he is so clothed and if we read aright he is frequently infested with "trench vermin". He is, in many cases, practically receiving a continuous dose of animal toxin. His method of handling it depends on the size of the dose and largely on his condition at its reception. In this connexion it would be interesting to know how the fat man takes it.

In an article on "Camp jaundice and the paratyphoid epidemic at the Dardanelles", we read in *The Lancet* of March 25th, 1916: "It is remarkable that according to various precise and 'revised' reports furnished by intelligent Turkish prisoners there was no case of jaundice amongst the Turkish troops, whose sanitary condition was in other respects deplorable and far inferior to that of the Allies, and who were separated only by a few yards from the French and British troops who were at the height of the jaundice epidemic." In other reports mention has been made of the fact that the Indian troops rarely contract "War nephritis". The peoples of both the Near and Far East have every opportunity to provide themselves with an anti-venom against many protozoa and metazoa. Their immunity is probably due to the presence in the blood of a specific anti-venom for the infesting vermin. May this animal venom not be the unknown but familiar "filtrable virus"?

The most outstanding inference from this hasty survey is that the digestive secretion of parasitic animals, hitherto considered innocuous, may act as a toxin when introduced into the tissues of the human subject, and that the life cycle of insects may explain the peculiar outbreaks and disappearances of epidemics, even when of bacterial origin, as there are probably many symbiotic relationships between insects and bacteria.

The writer's reason for placing this suggestion at once before the public arises from the belief that it is worthy of immediate investigation.

My hearty thanks are due to Dr. Maude Abbott for her scientific criticism and assistance.

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Abstracts of Medical Literature

BOTULISM. THE DANGER OF POISONING FROM VEGETABLES CANNED BY THE COLD-PACK METHOD. By Ernest C. Dickson, San Francisco. *Jour. Amer. Med. Assoc.*, September 22nd, 1917.

Dr. Dickson's article is most timely. In it he calls attention to the fact that food poisoning from the presence of the toxin bacillus botulinus is probably more frequent than generally believed, and that it is found in canned vegetables and fruits as well as in meats. He reports on twenty-two known outbreaks of botulism in the United States in twenty-years, which showed a mortality of 67·9 per cent. He emphasizes the fact that most of the cases were from vegetables and fruit sources. From his experiments he shows that the toxin may be found in a considerable number of vegetables and fruits, namely, peas, beans, green corn, and in mediums prepared from artichokes, asparagus, apricots, and peaches. He subjected artificially contaminated peas and beans and corn, prepared by the cold-pack method so widely recommended to-day, to laboratory tests, and found that the bacillus botulinus and bacillus subtilis were present in all cases, bringing out the fact that the method is not efficient in the event of the material being contaminated. This is a spore-bearing organism as well as an obligative anærobe. As the toxin is easily destroyed by heating he urges that all home canned products be boiled before being made into salads or eaten in other ways, or even tasted.

GOITRE. AN ANALYSIS OF 125 CASES, WITH A NOTE ON THE TREATMENT. By Leigh F. Watson, M.D., Chicago. *The New York Medical Journal*, September 22nd, 1917, vol. cvi, pp. 549 and 450.

THE author reviews the records of one hundred and twenty-five goitre patients, considering the cause, age at onset, and effect of previous operations in certain cases. He illustrates by tables the degree of enlargement, and reports the results following quinine and urea injection.

In 43 per cent. no exciting cause could be elicited; in the remaining 57 per cent. the onset could be ascribed to a definite exciting cause. Of the one hundred and twenty-five cases, 15 per cent. were caused by worry; parturition was responsible for 11 per cent., and in 9 per cent. the condition was due to puberty. Twenty per cent. gave a family history of goitre and 11 per cent. of nervousness; 19 per cent. had had tonsilitis. Forty-five per cent. of the exopthalmic patients first noted the goitre eight years before examination at the average age of thirty-four years, and the symptoms developed at the age of forty. Fifty per cent. gave a history of acute onset, two years before coming under observation at the average age of twenty-nine years. Sixty per cent. of the nonexopthalmic patients observed that they developed more marked symptoms of intoxication as the goitre became more chronic.

Before coming under treatment, five exopthalmic patients had had ligation of the superior thyroid arteries with temporary relief; four had had partial thyroidectomies without permanent benefit; three had had pelvic operations without lessening the hyperthyroidism; the condition of one was aggravated by a panhysterectomy; and one had had a tonsillectomy six months before without influencing the severity of the exopthalmic symptoms. Enlargement usually begins in the right lobe, sometimes in the isthmus and least frequently in the left lobe. In 95 per cent. of the exopthalmic patients of this group both lobes and isthmus were involved before the goitre became exopthalmic. A majority of the patients noticed increasing symptoms of intoxication as the goitre became more chronic, gradually involving both lobes and isthmus. Eighteen per cent. of the mildly toxic patients became exopthalmic after an average period of five years. This study indicates that both nontoxic and toxic goitre occur later in life in nongoitrous localities than in sections where the disease is more prevalent.

The following table shows the results after quinine and urea injections:

Effect of the Injection on Symptoms	Relieved	Improved	Not Improved
Exopthalmic..........	85 (aver. 4 mos.)	15	0
Nonexopthalmic.......	84 (aver. 2 mos.)	10	6

Effect of the Injections on Goitre	Cured	Reduced	Not Reduced
Exopthalmic..........	80 (aver. 5 mos.)	15	5
Nonexopthalmic.......	75 (aver. 4 mos.)	12	13

Two patients suffering with severe toxic goitre with exopthalmos of several years' duration received only slight benefit; later a lobectomy was done without additional relief. Four exopthalmic patients were pregnant two to four months. Relief from hyperthyroidism followed the injection and they went to term without recurrence and had normal deliveries. The number of patients cured is highest in the group of those who came for treatment early in the disease; the benefit received by those who came later was in proportion to the degree of damage done the circulatory and nervous systems. A goitre that has once disappeared has never recurred. A majority of the patients in this group have been under observation for two to four years. The quinine and urea injection has limitations the same as any other treatment for goitre and can be employed only in selected cases. The treatment of the exopthalmic type in young adults is very difficult, and should be attempted only under the most favourable circumstances. If the best results are to be secured, hyperthyroidal patients must have at least a year of mental and physical rest after treatment.

Obituary

DR. GILBERT PROUT GIRDWOOD

Dr. G. P. Girdwood, one of the most eminent men in the medical profession in Canada, died at his residence, 615 University Street, Montreal, on October 2nd. He was in his eighty-fifth year and had been ill for six years. For the past ten months he had not left his bed.

Although blind for the last five years he took a keen interest in all matters bearing upon medicine and chemistry. With the assistance of his devoted wife and daughter he recently made an investigation into the effect of carbonic acid in coal gas upon public health in England, United States, and Canada. The results of this important study were communicated to the Royal Society.

Dr. Gilbert Prout Girdwood was one of the best known and best liked as well as one of the most learned men of the medical profession in Canada. He was the son of G. F. Girdwood, M.D., of Edinburgh University.

Born in London, on October 22nd, 1832, he received his early education at a private school and subsequently entered University College and St. George's School of Medicine. He was admitted a member of the Royal College of Surgeons of England in 1854, and for a short time served as house surgeon in the Liverpool Infirmary. In the same year he was gazetted assistant surgeon of Her Majesty's Grenadier Guards. He accompanied the 1st Battalion of the Grenadier Guards to Canada at the time of the famous Trent affair in 1862, and on its return to England in 1864 retired from the army to take up his permanent residence and practice in Montreal.

In 1865 he took the degree of M.D., C.M., at McGill University.

He served for some years as surgeon of the 3rd Victoria Rifles, and served with that regiment at the front during the Fenian troubles, later receiving the medal. Not long after he was promoted to be a medical staff officer of the Militia of Canada.

In 1869 he was appointed lecturer in practical chemistry in the Faculty of Medicine at McGill. In 1872 he became professor of practical chemistry, and in 1879 professor of chemistry, and held this chair until 1902, when he retired from active teaching and was then named emeritus professor of chemistry.

For twelve years he was surgeon to the Montreal Dispensary and to the Montreal General Hospital, and following this service was appointed consulting surgeon to both institutions. He also became consulting surgeon to the Children's Memorial Hospital; consultant physician in the *x*-ray department of the Royal Victoria Hospital, and chief medical officer of the Canadian Pacific Railway.

Dr. Girdwood was a former president of the Rœntgen Society of America; vice-president of the Canadian branch of the Society of Chemical Industry; a fellow of the Chemical Society and also of the Chemical Institute of Great Britain.

On the organization of the Royal Society of Canada by the Marquis of Lorne (late Duke of Argyll), then governor-general, in 1882, he was appointed one of the original Fellows of that body.

He was a member of the College of Physicians and Surgeons of the provinces of Quebec, Ontario, and British Columbia; of both the British and the American Association of the Advancement of Science; of the Montreal Natural History Society; and of the Montreal Microscopical Society, of which he was elected president in 1892.

Dr. Girdwood in 1862 married Miss Merriman Blackwell, daughter of Thomas Blackwell, C.E., who was managing director of the Grand Trunk Railway. Mrs. Girdwood survives, with five sons and three daughters.

The late Dr. Girdwood was an interesting and conspicuous figure among the scientific men of Canada, especially during the last quarter of the nineteenth century. He was a type which our modern methods of education will not reproduce, the type of the all round scientist, cultured, enthusiastic and interested in all fields of science, in most of which he was very much more than a dilettante. He had a sound knowledge of medicine, surgery, medical jurisprudence, botany, physics, microscopical technique, including photomicrography, besides being fundamentally a chemist. Before entering the army medical service and while still a young man he studied chemistry in London and Liverpool, and with Dr. Rodgers, a London chemist, he devised the method which is known as the Rodgers and Girdwood method for the detection of strychnine, by which it is possible to detect a less than one hundred thousandth part of a grain of this poison.

During his career as a scientific man and while engaged in general practice he was connected with many important legal cases where his knowledge of medical jurisprudence was of great value to the country. He was not only a good toxicologist, but was the first to use enlarged photography and the application of reagents for the detection of forgeries and counterfeits and the identification of handwriting. In this field he was one of the best authorities in America.

In the field of microscopy he was also an expert in the identification of starch granules and was a pioneer in the stereoscopic photography of crystals under the microscope and also in the application of the stereograph to the study of the photographs produced by Rœntgen rays. He was the first to demonstrate that the position of a foreign object in relation to a bone could be shown perfectly by the application of stereoscopic principles in taking Rœntgen ray photographs.

The introduction of practical chemistry as an integral part of a medical student's education in Canada was first carried out by Dr. Girdwood in some classes which he gave to the medical students of McGill University about 1870. The classes were held in his own home on Craig Street. In 1872 he became professor of practical chemistry and for ten years always gave all of the instruction in practical chemistry in McGill University. He subsequently succeeded Dr. Craik to the chair of chemistry in the Medical Faculty in 1879, which chair he held up to 1902.

He was a man of high ideals and one of his great ambitions during his illness was to obtain legislation to place the profession of chemistry on the same plane as the professions of law and medicine.

His genial, kindly and humorous character won him a host of personal friends in all walks of life.

Dr. George H. Clemens, of Parkdale, Toronto, died suddenly on September 23rd, in the sixty-first year of his age. He was born near Preston, Ontario, and graduated in arts from Victoria University, and in medicine from the University of Toronto in 1880. He practised first at Kitchener, then at Barry, and, during the past twenty years, in Parkdale, where he was well known. Dr. Clemens was an enthusiastic bowler and had spent the greater part of the day before his death in his favourite pastime. He was summoned to the bedside of a patient late on Saturday night and on the following morning was found lying dead in bed. He leaves a son and a daughter, his wife having died about three years ago.

Dr. William Kier, of Malpeque, Prince Edward Island, died September 17th, in the ninety-third year of his age. It is almost seventy years since Dr. Kier began to practise at Malpeque and throughout this long period his life has been marked by a simple devotion to duty that won both confidence and affection, and a keen interest in the welfare of the community he served. In spite of his years Dr. Kier was able to continue to practise until a few days before his death. He was the son of the Rev. Dr. Kier, the founder and first minister of the Presbyterian Church at Princetown; and a graduate of the Pennsylvania Medical University of the year 1864. He leaves two daughters and three sons, two of whom are members of the medical profession.

Dr. H. W. Wood, who died at St. Johns, Quebec, on September 27th, was the son of the late Honourable Thomas Wood, a member of the first legislative council after Confederation. He was born at Dunham, Quebec, in 1839, and graduated in Arts from the University of Vermont, and in medicine from McGill University. He practised at St. Johns and at Knowlton, but retired from active practice some years ago. Dr. Wood leaves three sons and a daughter. His wife died about eighteen months ago.

Dr. W. J. R. Holmes, who died at Goderich, Ontario, on October 14th, was well known throughout Huron County. He was born at Holmesville, on January 19th, 1842, the son of Mr. John Holmes, member of the Legislature of Upper Canada for the counties of Huron, Perth and Bruce, and was educated at the Goderich Grammar School and Upper Canada College. His medical education was obtained at the University of Toronto. Upon graduation, Dr. Holmes obtained a commission in the Northern Army, with which he served until the end of the American Civil War. He then returned to Canada and took up practice at Bluevale, and afterwards at the village of Brussels, in Huron county. Taking an active interest in all public affairs, Dr. Holmes was appointed reeve of the municipality and, a strong conservative in politics, contested on two occasions Huron ridings. In 1883 receiving the appointment of treasurer of Huron county, he removed to Goderich, where he resided up to the time of his death. He was also county coroner and secretary-treasurer of the Goderich Collegiate Institute Board. From the commencement of the war Dr. Holmes had taken a keen interest in Red Cross and patriotic work of all kinds and his death will be a distinct loss to the community.

Dr. George Burnham died at Peterborough, Ontario, on

Monday, September 17th, at the age of seventy-five years. Dr. Burnham was a son of the late Reverend Mark Burnham, rector of St. Thomas Church, Peterborough, and was highly esteemed. He took an active part in promoting the welfare of the citizens and had been a member of the Board of Education since 1880. Dr. Burnham's nearest relative is a nephew, Captain George Burnham, who at present is on active service overseas. Mrs. Burnham died in 1916.

Dr. George W. Ling, who died at Dutton, Ontario, in September, was born at Hamilton and was a graduate of the University of Toronto.

Dr. F. H. Drake, who died suddenly of heart failure on October 6th, was a well-known physician in London, Ontario, and a member of the medical faculty of Western University. He leaves a widow and infant son.

News

MARITIME PROVINCES

Dr. Albert E. MacCaulay, superintendent of the General Hospital, St. John, New Brunswick, has resigned.

ONTARIO

We learn from the daily press that Lieutenant-Colonel W. T. Connell, C.A.M.C., has resigned from the post of consulting physician to the Kingston Penitentiary and that Dr. Robert Hanley will assume all duties pertaining to the office of physician to the penitentiary. Dr. Hanley will also continue his private practice.

Mr. R. S. McLaughlin, of Oshawa, has given his residence on King Street, Oshawa, to the hospital board to be converted into a maternity hospital.

The cornerstone of a new wing of the Women's College Hospital, Toronto, was laid on September 19th, last, by Lady Eaton. The building is three storeys high and has been built with funds collected some months ago by a house to house campaign. The furnishings will be supplied by the women's auxiliary of the hospital.

Dr. Frederick S. Minns, formerly chief medical inspector of the Board of Education, Toronto, has resigned. Dr. Minns continued his work under the Board of Health for some time after the medical inspection of schools had been transferred from the Department of Education to the Board of Health.

During the month of September 316 cases of diphtheria were reported in the province. The list of cases of infectious disease reported is as follows: Diphtheria, 316 cases, 15 deaths; scarlet fever, 98 cases, 1 death; measles, 104 cases; whooping cough, 172 cases, 7 deaths; typhoid, 111 cases, 11 deaths; tuberculosis, 118 cases, 46 deaths; infantile paralysis, 27 cases, 1 death; cerebrospinal meningitis, 9 cases, 6 deaths; smallpox, 6 deaths.

Dr. A. A. McLean, of Duart, has removed to London, Ontario.

A deputation waited on the Ontario Government on October 12th, with a request that venereal disease be classed as "contagious" and be subject to the same regulations as other contagious diseases. The government promised consideration of the matter. The members of the deputation were: Dr. Hastings, the medical officer of health; the chief of police, Captain Gordon Bates, C.A.M.C., and Captain Sinclair, provost marshal. The same request was also made by a deputation from the Toronto Board of Health.

At a meeting of the Toronto Board of Control on October 9th a resolution was passed in favour of the appointment of a hospitals commission. Applications have been received by the Board for extra grants to enable the hospitals to pay off deficits which are the result, partly, of the increase in the cost of maintenance.

Lieutenant-Colonel Charles Hawkins Gilmour, M.C., C.A.M.C., of Toronto, has been admitted as a member of the Royal College of Surgeons, London.

MANITOBA

The death rate in Winnipeg during the first six months of this year was appreciably less than during the same period last year. The number of cases of diphtheria, however, was greater than last year, the death rate being 39·9, as compared with 25 per 100,000 during the same period last year. Anti-toxin is distributed free by the Department of Health and everything possible is being done to encourage people suffering from sore throats to report at once for examination.

SASKATCHEWAN

The Providence Hospital, at Moose Jaw, which has been built by the Sisters of Charity, was formally opened on September 19th.

The Isolation Hospital, at Saskatoon, has been completed. The building, which is adjacent to the City Hospital, comprises four wings and contains twelve wards, with additional accommodation for the nursing staff. Two of the isolation shacks that were formerly used will be retained and will be used for cases of tuberculosis and for patients suffering from mental disease. It is satisfactory to learn that arrangements have been made for the accommodation of insane patients pending their removal to an asylum so that it will no longer be necessary to place such unfortunate people in the common jail.

BRITISH COLUMBIA

The work of the Esquimalt Convalescent Hospital has lately been extended by the addition of a department of vocational training. A modern schoolroom has been built on the hospital grounds, where instruction is given in bookkeeping, commercial arithmetic, stenography and typewriting, and a shop has been erected for the purpose of giving mechanical instruction. Here suitable mechanical work is given to men who are undergoing treatment, and training is provided for those who wish to fit themselves to become wage-earners in the future. The work is supervised by a returned soldier, who is a practical mechanic, under the direction of Mr. G. H. Deane, the vocational officer for the province of British Columbia. The medical officer in charge of the Esquimalt Hospital is Dr. E. S. Hasell, who was formerly on the surgical staff of the Victoria Jubilee Hospital.

MEDICAL COLLEGES

Manitoba University

At a recent meeting of the Board of Governors of the University of Manitoba, it was proposed that no unmarried man of twenty years of age or over should be permitted to attend lectures or take examinations unless he was able to furnish sufficient reasons for not enlisting. Approval was given to a proposal that military training of male students should be made compulsory.

Toronto University

In a recent speech Sir Robert Falconer stated that there were at present six thousand undergraduates of the University of Toronto on active service and of these at least one thousand were serving in the ranks. He thought that medical students should be exempt from conscription and that members of the medical faculties of the universities should be formed into medical corps, whose services would be available, if needed, for the treatment of returned disabled soldiers.

Western University

The registration in the Faculty of Medicine is about the same as last year. Lieutenant-Colonel Hadley Williams, C.A.M.C., has returned from England where he was attached to the staff of the Orpington Hospital, and is in charge of the department of surgery.

Dalhousie University

Dalhousie University opened for the present session on October 2nd. There is a large entry in the first year of medicine, the largest since the creation of the Medical Faculty. Almost all the students of the higher years have returned, and though many members of the teaching staff are still on military service, those who are left are maintaining efficient teaching by undertaking the work of their absent colleagues.

McGill University

The session for the first, second, third and fourth year opened in McGill University, Faculty of Medicine, as usual, on October. 1st. The fifth year students had already been at work for a month and a half, the Faculty having agreed, at the request of the military authorities, to graduate this class on or about April 1st, 1918.

The total number of students registered this year in the Faculty of Medicine is three hundred and sixty-two. In the first year there are ninety-three men, this number being considerably in excess of last year's registration.

The dental students this session total forty-two, of whom twenty-two are in the first year.

ARMY MEDICAL SERVICES

LIEUTENANT-COLONEL R. M. SIMPSON, C.A.M.C., of Winnipeg, has been appointed to the command of No. 1 Canadian General Hospital in France.

IT has been decided to use the buildings recently put up at Red Deer, Alberta, and which were intended as an institution for feeble-minded children, as a hospital for returned soldiers suffering from shell shock.

IN our August issue the name of Captain Robert James Manson was given as having received the Military Cross. The name should have been Captain Robert James Manion, as it appeared in the October number of the JOURNAL.

THE Old Government House, at Ottawa, is to be converted into a convalescent hospital for returned soldiers. In addition to remodeling the present building, it is the intention to add three units, A, B and C, each of which will be connected with the other. The first two, which will measure two hundred and sixteen by forty feet, will be used as sick wards while unit C will contain the kitchens, dining room, etc. Sun parlours will be added at both ends of wards A and B. When finished, the hospital will accommodate about four hundred and fifty patients.

CAPTAIN ARMSTRONG, C.A.M.C., who recently returned from the front, has been appointed to the command of the Ross Military Hospital at Moosejaw, Saskatchewan. Captain Armstrong has been decorated both with the Military Cross and the *Croix de Guerre*.

CAPTAIN W. B. SHAW, C.A.M.C., has been appointed to the command of the Fairmount Military Hospital, Victoria, British Columbia. Captain (Acting Major) Shaw was wounded about a year ago in France while in command of the 37th Battery of Canadian Artillery and has not yet sufficiently recovered his health to return to the front.

CAPTAIN D. F. MCKINLEY, C.A.M.C., is attached to the staff of the Toronto Base Hospital.

CASUALTIES

Wounded

CAPTAIN J. MOORE, C.A.M.C.

CAPTAIN F. F. DUNHAM, C.A.M.C.

Canadian Literature

ORIGINAL CONTRIBUTIONS

The Public Health Journal, June, 1917:

Poliomyelitis	H. W. Hill.
Clinical studies of infantile paralysis	E. J. Durocher.
Public health in the average town: ways and means of conducting	C. A. Patterson.
Practical points in the enforcement of the regulations and the difficulties of the medical officer of health	H. Rose.
How can a rural municipality employ a public health nurse?	J. F. Hanly.
Overcrowding: why is it tolerated	Thos. Watson.

The Canadian Practitioner and Review, August, 1917:

The evolution of the surgery of the biliary system	W. Wayne Babcock.
Safeguarding the health of children	C. E. A. Winslow.

The Canadian Practitioner and Review, September, 1917:

The value of the Wassermann reaction in in the diagnosis and treatment of syphilis	A. S. Clark and R. S. Nelson.
Difficulties of a rural medical officer of health	D. A. Kidd.

Dominion Medical Monthly, August, 1917:

Christian science and its claims	J. Ferguson.

The Public Health Journal, July, 1917:

Variola	J. B. Boyle.
State wide education in Social Hygiene	Wm. T. Foster.
The Rochester Bureau of Health consultation	G. W. Goler.
The illegitimate child	J. J. Kelso.
Illegitimacy: Preventive aspects	Margaret Patterson.
Some observations on scarlet fever	J. C. Hutchinson.
Scavenging	Douglas Little.

The Western Medical News, June, 1917:

Prostatic obstruction	J. W. Turnbull.

The Public Health Journal, August, 1917:

The control of venereal diseases	Gordon Bates.
The venereal disease campaign in New York city	L. Chargin.
The Church and sanitation	G. G. Melvin.

The Public Health Journal, September, 1917:

Preventive medicine	G. E. DeWitt.
The epidemiology of epidemic poliomyelitis or infantile paralysis	A. G. Nicholls.
Diagnosis of anterior poliomeylitis	C. Miller.
Poliomyelitis anterior acuta	M. D. Morrison.
The venereal disease problem	W. H. Hattie.

L'Union Médicale du Canada, July, 1917:

Paralytique général	A. LeSage.

Le Bulletin Médical de Québec, July, 1917:

Tablettes digestives aromatiques, absurdites therapeutiques	L. F. Dubé.
Le poison dans l'histoire et les grandes empoisonneuses	A. Vallée.

Medical Societies

THE CANADIAN ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS

The seventeenth annual convention of the Canadian Association for the Prevention of Tuberculosis took place in the Normal School, at Ottawa, on Wednesday, September 26th, following the two days' meeting of the Canadian Conference of Charities and Corrections. The president, the Honourable J. W. Daniel, M.D., of St. John, New Brunswick, was in the chair.

The meeting was a successful one and the report of the year's work, submitted by Dr. George D. Porter, the general secretary of the Association, and printed in full below, was extremely encouraging. After the nomination of committees had been made, a description of the measures adopted in Quebec for the prevention of tuberculosis was given by Dr. O. Leclerc, who stated that a sanatorium was shortly to be opened at St. Foyenert. A paper by Dr. F. S. Minns, of Toronto, entitled, "School work against tuberculosis," gave rise to an interesting discussion, led by Dr. J. A. Hutchinson of Westmount, Quebec, who referred particularly to the value of the open-air schools. A paper on "Organization in a city," by Dr. D. A. Craig, of London, Ontario, was discussed by Dr. J. K. M. Gordon, of Ottawa, and Captain Hill, of London, the appointment of district military medical officers to supervise discharged tuberculous soldiers being advocated. These were followed by a contribution from Dr. D. A. Stewart, of the Ninette Sanatorium, Winnipeg, whose remarks were of particular interest. Taking as his subject "Tuberculosis and maternity", Dr. Stewart showed that just as in the trenches tuberculosis developed in men whose resistance had been lowered by hardship and exposure, so in civilian life the causes of breakdown were the causes of the spread of the disease. Each year in the Dominion no less than twenty-four hundred tuberculous mothers gave birth to children. Childbirth, when it entailed expenditure beyond the income of the parents, was health bankruptcy. In the discussion which followed Dr. Stewart's paper, Dr. Adam Wright, of Toronto, declared that no woman suffering from tuberculosis had a right to marry.

The afternoon session was devoted to a discussion of the military aspect of the tuberculosis question and the measures taken to promote the welfare of the tuberculous soldier. Captain J. H. Elliott, of Toronto, spoke of the incidence of the disease in the Canadian Forces—there are some three thousand cases already under treatment in England and Canada, many of which have never been overseas but have developed during the period of preliminary training. A report on the "Results of treatment" was contributed by Dr. W. B. Kendall, of Gravenhurst, and an account of "Vocational training" was given by Captain R. Roddick Byers, of Ste. Agathe. The session closed with an article entitled, "What the Military Hospitals Commission is doing for the tuberculous soldier," by Lieutenant-Colonel Thompson, M.P., medical superintendent of the Commission.

The presidential address was delivered in the evening by the

Honourable J. W. Daniel, M.D., of St. John, New Brunswick, who spoke of the work accomplished by the Association in preventing the spread of tuberculosis. The president pointed out that in the province of Ontario the death rate from the disease had already been reduced from 149 to 91 per 100,000. The public address was then delivered by Dr. W. A. Evans, of Chicago, the president of the United States Public Health Association, who, avoiding technicalities, explained and suggested ways and means by which tuberculosis could be prevented.

The officers of the Association elected for the year 1917-1918 are: President, J. A. Machado, Esq., of Ottawa; vice-presidents, Sir John Gibson, of Hamilton; Senator McLennan, of Sydney, Nova Scotia, a member of the Military Hospitals Commission, and the Honourable R. L. Thornton, Minister of Education in the province of Manitoba. Sir George Burn, of Ottawa, the honorary treasurer, and Dr. George D. Porter, the general secretary, were reëlected. The new members of the executive committee are: Dr. D. A. Stewart, of Winnipeg; Dr. G. Townshend, of New Brunswick, and Major J. G. Fitzgerald, of Toronto.

Resolutions were adopted in favour of the establishment of tuberculosis clinics in cities where none at present exist; the extension of the anti-tuberculosis movement towards the training and for the protection of the youth of the country; the careful examination of recruits by chest specialists before acceptance into the army; and the pasteurization of all milk and cream used in the manufacture of butter and cheese. The establishment of a Bureau of Public Health was again urged upon the government.

The following is the report of the secretary for the year 1916-1917:

In our Executive Report presented last year in the city of Quebec, we stated that "It was encouraging to note that in spite of the war and its many drawbacks very considerable progress had been made". To-day the same could be truthfully repeated and it might also be added that as a result of the war and its many casualties, the question of tuberculosis has received more attention from both the government and the people than ever before. This holds true not only at home but also abroad. In France, where the ravages of tuberculosis are exciting much apprehension, great efforts are being made to improve conditions.

As Dr. Biggs points out, "The plight in which France finds herself to-day because of tuberculosis (at the end of 1915, eighty-five thousand French soldiers had been returned to their homes with active tuberculosis, and it is estimated that by now the number will have reached one hundred and fifty thousand) is due almost entirely to her failure to recognize this disease as a serious problem during the years before the war started and to take precautions against it. There never has been any real organized French movement against tuberculosis. Except for a very few private sanatoria, most of which were seaside resorts for children, and except for a few occasional utterances of doctors about scientific aspects of tuberculosis, the rank and file of the French people knew nothing and cared less about the nature, treatment or prevention of this very serious plague. In this connexion, however, we must remember that France has an enormous army at the front, and that tuberculosis always had a high mortality in that country.

In Britain, early in the second year of the war, twenty-seven hundred and seventy tuberculous soldiers had been discharged from the army, and this year the numbers must have been very greatly increased, but with no such appalling figures as in France. "In Britain, however, the tuberculosis problem had been efficiently met before the war, in France, on the other hand, nothing had been done." We might add that the British love for outdoor life has been a great factor in conserving the national health.

We learn that there is a great deal of tuberculosis in German prison camps, which is developed by neglect of the most elementary hygienic precautions, and according to reports the death rate from this disease is Berlin has increased 56 per cent. over that of last year.

In Switzerland they are caring for a large number of tuberculous soldiers and an international association is now being organized for the purpose of erecting an immense sanatorium there to provide for two thousand patients.

In Italy the government is directing its efforts and large sums of money towards the creation of anti-tuberculosis dispensaries and the assistance of those already in existence.

In the United States, Surgeon General Gorgas has established a bureau for tuberculosis, which is now organizing a corps of experts to work in every naval camp. All members of the army will be given an expert examination and, since it is realized that if exposed to the strain of life in the trenches they will break down and have to be invalided home, men found to be suffering from active tuberculosis will be debarred from service.

Here in Canada we have eleven hundred and ninety-four tuberculous soldiers, and there are some hundreds being treated in Britain at the present time. As the average cost per annum of a civil patient in sanatoria for institutional care alone is $637, we must add $53 a month for married men returned from the front, or $33 for single, making the cost per annum of a returned tuberculous soldier about $1,300.

All this shows that the problem of tuberculosis and its prevention is one of the great war problems with which we have to contend. In this particular the matter of education is of vital importance, and the need for our Association will be greater rather than less as a result of the war.

During the past year the work of our Association has been steadily going on and its educational campaign is making its influence felt not only among our civil population but among the soldiers as well.

The wide area of our Dominion, with its scattered population, makes such a campaign more difficult, but with the Federal government's allowance, which pays for all our literature, and its assistance in granting us franking privileges for the same, we have been able to carry on a steady propaganda. During the year our literature has been increased by the addition of a splendid pamphlet on tuberculosis, which is having a wide circulation. Among those requesting copies were the military authorities, and every military district had already received copies. We have also mailed a large number of pamphlets, leaflets, reprints and papers on the various phases of tuberculosis, as well as large editions of our reports in both English and in French.

Our new poster exhibits are now ready and should prove very useful for teaching the young, in schools, colleges, at fairs and in various dispensaries and local societies.

That our reports and literature are appreciated we know from the many letters received, and it might be interesting to quote from one received from the statistician of the Prudential Life Assurance Company of New York: "The report," he says, "makes a notable contribution to the subject and emphasizes the conclusion that we are only at the beginning of a really effective national campaign. One of the most valuable portions is the inclusion of sanatoria treatment, which in course of time must prove of much practical importance." It is the number of letters, however, constantly being received from all over the country requesting information on tuberculosis, that proves the usefulness of our work.

The fruits of education show clearly in the provision made for those already tuberculous, and while emphasizing the fact that only a comparatively small percentage (approximately some 5 per cent.) of civil patients are now being treated in Canadian sanatoria, yet where sufficient accommodation is provided there the work of prevention is bound to grow. As the American Bureau of Labour *Bulletin* on Workman's Insurance points out, "The sanatorium treatment of tuberculosis has its inherent limitations, which, however, do not in the least detract from its far reaching usefulness."

Without the numerous sanatoria and hospitals provided throughout Canada before the war, the authorities would have been at a serious loss for accommodation and properly trained staffs for the reception and care of the tuberculous soldier.

Before the war we had bed accommodation for nearly two thousand patients. Some twelve hundred soldiers have since then been admitted. The large increase in our sanatorium patients, therefore, has made the problem of care and treatment as well as prevention one of greater national importance than ever before.

In this connexion we may mention the activities of the Military Hospitals Commission which is doing a splendid work in this field, and under whose powers the extra eleven hundred beds have been made available. We are fortunate in having on our programme Colonel Thompson, medical superintendent of the Commission, who will deal more especially with this phase of the subject.

At our last convention held in Quebec City the executive council considered the question of the returned tuberculous soldiers and submitted to the Hospitals Commission, through Drs. Parfitt and Elliot, the following resolutions:

1. "That the tuberculous soldiers should be treated in special institutions (sanatoria) and that, as far as possible, use be made of existing institutions."

2. "Preferably each man to be cared for in his own province, i.e., that in each military district where there is now one or more sanatoria, as far as possible, additions be provided so as to ensure a bed for each tuberculous soldier from that district."

3. "That there be a central Federal sanatorium for those who cannot be provided for in their own districts, and for those difficult to continue in civilian institutions. In view of the prolonged treatment which will be necessary in many cases even after the active symptoms have ceased, it would seem desirable to have a

farm or garden in connexion with the military sanatorium that graduated labour, which has proved a valuable therapeutic measure, may be made use of in treatment."

4. "That some arrangements be made whereby patients may be transferred from one sanatorium to another where climatic changes may seem desirable."

5. "That it is essential in the interest of the patient and the public that the present ruling of the Department of Militia whereby every tuberculous soldier must be discharged (under pension if not well) at the end of six months in a sanatorium in Canada, should be modified so as to apply only to the closed non-infectious cases, and to those who, in the opinion of the medical officer of the sanatorium may be safely allowed to return to their homes."

"Many of those with bacilli in the sputum still present at the end of six months' treatment have shown themselves to be careless of their sputum and will consequently be a menace to the health of the household in which they live, particularly in the presence of children.

"Others will have shown that away from control they will immediately relapse from the strict sanatorium methods of life, which alone will ensure recovery, and will soon be suffering from a return of active symptoms.

"These are two classes of cases who will not avail themselves of the privilege of continued free treatment now offered them at the end of six months.

"To overcome this great menace to public health, it is recommended that the medical officer of the sanatorium be allowed to keep such men on pay (which is less than pension) until such time as he considers them ready for final medical board."

Coming to the various local activities throughout Canada during the year, we may say that many additions have been made in the various sanatoria, the latest being under the auspices of the National Sanatorium Association and consisting of another addition to the Hospital for Consumptives at Weston, and a new cottage annex to the Queen Mary Hospital for Consumptive Children in the same place. These were formally opened last month by His Excellency the Duke of Devonshire. Our former president, Sir Adam Beck, and Lady Beck have just donated a nurses' home to the splendid institution at London.

Practically every sanatorium has been enlarged by the addition of pavilions or otherwise, for the accommodation of soldiers, while some of the institutions have been taken over entirely for their use. The activities of the visiting nurses have also been greatly augmented, especially in Manitoba, where some twenty-five district nurses are to be employed, and the health department work in this field, as shown especially in the city of Toronto, where some forty health nurses are engaged, is proving one of the greatest factors in the anti-tuberculosis campaign. The dispensaries, such as the May Court Club of Ottawa, the Royal Edward Institute in Montreal, and others elsewhere, are doing most valuable work. A perusal of the various local reports, to be published later in our annual report, will show in detail the various local activities.

Another very important improvement is the increasing number of sputum examinations now being made in the various laboratories.

Naturally the war has changed many things in regard to former tables and reports. For instance, the cost of maintenance which in 1914 was $1.55 per diem is now, owing to the increased cost of food and labour, $1.75 per diem in Canadian sanatoria, and it might be well just here to emphasize a point brought out by Dr. Byers, of Ste. Agathe, as to the necessity of avoiding waste in foods served at the table but not utilized. Dr. Byers points out that already a considerable saving has been made at Ste. Agathe by more attention to these details.

The ratio of male and female patients will also be changed by the admission of so many soldiers to our institutions, and owing to the sudden influx of so many otherwise fairly able-bodied men, suddenly thrown on their backs as it were, more attention is being paid than ever before to the question of vocational training both as a therapeutic measure and also as a means of providing more or less of an income.

As some 35 per cent. of our tuberculous soldiers have as yet never been overseas, it might be opportune to quote a series of resolutions passed at the annual meeting of the American National Association for the Prevention of Tuberculosis, held in Cincinnati:

Whereas, it has been the experience of the warring nations of Europe that cases of incipient and even moderately advanced tuberculosis are frequently unrecognized in the routine examination of recruits, Resolved, that this Association urges upon the Council of National Defence the following measures:

(a) To made repeated routine examination and observation of recruits while in training and mobilization camps for the purpose of detecting any obscure tuberculous lesions;

(b) To utilize and enlarge the existing sanatoria and hospitals of our country so that all cases of tuberculosis arising in our forces may be adequately cared for as near as possible to their own homes;

(c) To work out in coöperation with existing authorities a definite, comprehensive and constructive programme for adequate prevention and control of tuberculosis among the whole population.

In connexion with the work in other countries it might also be pointed out that the Rockefeller Foundation has announced that with the approval of the French Government and in coöperation with the American Red Cross the services of the International Health Board of the foundation have been placed at the disposal of France in the fight to control the spread of tuberculosis in that country. The foundation has made an initial appropriation of $100,000 for this campaign, with which the preliminary work of central organization, the equipping of mobile units and the publication of literature will be handled.

The present plans of the International Health Board are:

First. The maintenance of a central organization which will have general supervision of the work. This organization will be under the French government and will combine the special interests in anti-tuberculosis work. It is probable the central committee among other things will carry out a comprehensive plan of education for the control of tuberculosis.

Secondly. The organization of four mobile units which, moving from place to place, will carry on a campaign of education and publicity.

Thirdly. Demonstration of dispensary methods and organization of local committees under whose auspices permanent dispensaries will be established.

Fourthly. The establishment of at least four centres for the training of nurses and others who will have charge of the dispensary work.

With all this before us it seems of urgent importance not only to take all possible steps for the prevention of tuberculosis among soldiers, and for the care and treatment of those who develop the disease, but also to see that Canada, as a whole, prepares itself for any general increase of tuberculosis that may arise either directly or indirectly as a result of the war.

Here we might quote from the Hamilton *Times* in speaking of the work of the Military Hospitals Commission:

"With this effective organization of treatment for military consumptives before our eyes, it will be absolutely inexcusable if the country fails to organize an equally efficient campaign against the 'white plague' among our people as a whole.

"The gain in health and wealth to the country would be simply enormous. As Lord Shaughnessy was quoted as saying a few days ago, 'As many Canadians have been killed by tuberculosis since the war began as have been killed by the war itself. Yet it is an entirely preventable disease. If we stop its ravages, we shall more than make up for the ravages of the war.'

"When a soldier is found to have tuberculosis he is given the most scientific treatment in a sanatorium, for as long as his case requires. And he is taught not only how to conquer the disease in himself, but how to avoid spreading it to others. If the same systematic care were applied to civilian consumptives, the gain in health and wealth to the country would be simply enormous.

"We must never forget that these soldier patients in the various sanatoria will themselves be civilians again in a few weeks or months. Instead of being a source of infection and danger as they would have been without the treatment they are now receiving, their return to civil life will be an actual gain to the community; for, by preaching what they practised, they can do much to rouse us from our lethargy and start a vigorous offensive against this ravaging foe."

We can only point out that the methods proposed for the work to be done in France are along the lines adopted in the United States and in Canada to-day. Through private initiative and philanthropy, aided by government and local support, and through a widespread, though insufficient educational campaign, which has been going on in Canada during the past seventeen years, there have sprung up some thirty-five institutions accommodating as said before, some two thousand patients; and with dispensaries, local societies and visiting nurses, with school inspection and outdoor schools opening here and there, and health departments in various centres taking an active interest in the prevention of tuberculosis, we feel assured that a fine beginning has been made. In fact we have not done so badly when we recall that in Germany they had proportionately less than we had, for in spite of their great population they had only twelve thousand beds available for their tuberculous before the war.

Up to the present the anti-tuberculosis movement in Canada has been entirely voluntary; the work done, assisted more or less by the various governments, has been initiated, may we repeat, by private endeavours; but the time has come when the people, as well as the Federal Government should recognize their responsibility to the tuberculous civilians as well as to the soldiers, and from these war emergency measures some permanent institutions and much good should result.

With the inevitable loss of man power due to the war, there is all the more reason to conserve the health and strength of the people, and especially that of the young, for the silent enemy tuberculosis is taking off as many Canadian lives every year of the war as are the German guns at the front.

It would be unfair to close this report without referring to the magnificient work of the Imperial Order of the Daughters of the Empire throughout Canada in regard to the prevention of tuberculosis. It is impossible to read the many local reports of the Association without observing how much of their success depends upon some chapter of this great organization. This, we feel, is due to the initial efforts and inspiration of Mrs. Crerar, of Hamilton. While they have but one institution, the model Preventorium in Toronto, directly under their charge, the cost of which was borne by Colonel and Mrs. Albert Gooderham, practically all the institutions are indebted to them for their wholehearted coöperation and support.

The Victorian Order of Nurses have also done much to assist in their especially important branch of the work in various districts.

While provision for the tuberculous in the minds of some should be a government matter entirely, yet, though in nowise minimizing the responsibility of the government, we urge the continued help of all volunteers and all voluntary agencies, for it is the personal help, the enthusiasm and the personal touch, which give to this great movement for humanity such life and so much hope.

Geo. D. Porter, M.B.

CANADIAN PUBLIC HEALTH ASSOCIATION

The Sixth Annual Congress of the Canadian Public Health Association was held in Ottawa on September 27th and 28th last. The attendance was very representative, members being present from every province of the Dominion. The programme was arranged to include a symposium on or discussion of four main topics. The first morning session was devoted to a discussion of the venereal diseases problem and most interesting papers were read by Captain Gordon Bates, of Toronto, by Major Lauterman, of Montreal, for Lieutenant-Colonel F. S. Patch, of Montreal, and by Dr. Hector Palardy, of Hull, Quebec. The discussion was opened by Captain H. W. Hill, of London, Ontario.

At the first afternoon meeting the Presidential address was delivered by J. D. Pagé, of Quebec. It was a comprehensive and forceful presentation of many aspects of the immigration question. Following this, a symposium on national health insurance was held in which Mr. Miles M. Dawson and Dr. I. M. Rubinow, of New York, and Dr. C. J. Hastings, of Toronto, participated. The discussion was opened by Dr. John P. Morton, of Hamilton. This was a most interesting session and really opens the educational campaign on sickness insurance, etc., in Canada. It is a matter of interest that these two sessions are the first ever held in Canada which have been devoted to the discussion of these topics. The papers will appear in the *Public Health Journal.*

The morning session of the second day of the meeting was devoted largely to child welfare and housing. Dr. Alan Brown and Miss Mary Power, of Toronto, and Mrs. J. A. Henderson, of Montreal, made important contributions to the first subject. Mrs. A. M. Huestis and Mr. F. A. Dallyn presented papers on "Housing," and the paper of Mr. Dallyn was illustrated by excellent lantern slides. Both of these speakers dealt in an adequate manner with this extremely important subject in its relation to civic betterment. Dr. J. A. Bandouin, of Lachine, read a paper on the "Milk question." Papers were also read by Dr. F. C. Middleton, of Regina, for Dr. M. M. Seymour, on "Vital statistics", by Dr. W. H. Hattie, of Halifax, on "Some medico-sociological problems arising out of the war", on "Reducing quarantine periods" and "The provision of custodial care of recalcitrant open tuberculosis cases", by Captain H. W. Hill, of London. Dr. Helen MacMurchy, of Toronto, read a paper on "The influence of mental defectives on the public health".

A meeting of the Laboratory section was held on the afternoon of September 28th, when papers by Colonel G. G. Nasmith, of Toronto, Professor A. Vallée, of Quebec, Captain R. D. Defries and Dr. H. K. Detweiler, of Toronto, were presented. Mr. Joseph Race, of Ottawa, brought forward the provisional draft of the report of the committee on "Standard methods of water analysis". This section was well attended.

Hamilton was chosen as the place of meeting for 1918 and joint sessions will probably be held with the Ontario Health Officers'

Association in that city during the last week in May, 1918. The following officers were elected:

Patron, His Excellency, the Governor General; honorary president, Sir John Gibson, Hamilton; president, Dr. W. H. Hattie, Halifax; vice presidents, Dr. J. A. Hutchinson, Westmount; Mrs. A. M. Huestis, Toronto; Dr. George Clinton, Belleville; general secretary, Major J. G. Fitzgerald, Toronto; treasurer, Captain George D. Porter, Toronto.

THE KINGSTON AND FRONTENAC MEDICAL SOCIETY

This Society which counts among its members all doctors resident in the county of Frontenac in the province of Ontario, including the members of the Kingston Medical and Surgical Society, as it was formerly called, held its first meeting after the vacation on September 10th, with the president, Dr. Gordon Mylks, in the chair.

Dr. Day gave a further report on a case of congenital obliteration of the bile ducts and gall bladder. The diagnosis had been confirmed by operation. The jaundice had developed on the fourth day. The child at birth weighed eight and a half pounds. Owing, probably in part, to a painful cephalo-hæmatoma its weight dropped to six and a half pounds a few days later. The jaundice at present is intense, but the child takes its food well, is now eight months and twenty-one days old, weighs twelve pounds fourteen ounces, is twenty-six inches in length, and has a chest measurement of seventeen inches. Dr. Day was asked to present to the Society the further progress of the case.

Dr. Mathieson presented a patient with pyloric cancer from Dr. Third's service in the general hospital.

G. T., æt. fifty, farmer. Family history, negative. Personal history, always healthy and strong. Three months ago noticed appetite for meat failing, but continued his work until one month ago. Usual weight 175, present weight 132. Was admitted to hospital September 7th. Vomits frequently large quantities of dark-brown material. Stools tarry. Bowels obstinately constipated. No evidence of tumour. Tenderness on pressure one inch to right and one half inch above umbilicus. Stomach contents after a test meal showed: total acidity 132, no free HCl, a brisk lactic acid reaction, a trace of blood (Benzidin test), and very large numbers of Boas-Oppler bacilli with a few yeast cells.

Dr. Third's paper on "Tuberculosis", read at the recent meeting of the Canadian Medical Association, was discussed and his conclusions generally supported. The Society strongly approved of the suggestion that every effort should be put forth to educate the public to the great need of protecting the young child, at all times, from open cases of tuberculosis. A resolution was passed and forwarded to Ottawa urging the establishment of a Federal ministry of health. Colonel Gardiner, A.D.M.S., said, while he favoured the resolution, he had grave doubts of its being of any service. It was, however, pointed out that a similar resolution passed by the Society in October, 1914, urging the Ontario Medical Council to take up anew the question of reciprocal registration with Great Britain had had the desired effect, and that too, within a few weeks of the initial movement by this Society. Captain Hopkins, late of Saranac and Loomis Sanatoria, and now officer commanding the Mowatt Memorial Hospital (tuberculosis), was present, by invitation, and took part in the discussion.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

The fourteenth regular meeting of the Society was held Friday, April 20th, 1917, Dr. W. S. Morrow, president, in the chair.

The meeting took the form of a symposium on syphilis and was opened as follows:

1. Historical review, by Dr. M. Lauterman.
2. Skin lesions (illustrated), by Dr. G. G. Campbell.
3. Diagnosis and treatment, by Dr. R. E. Powell.
4. Lesions of the central nervous system, by Dr. D. A. Shirres.
5. Congenital lues, by Dr. T. P. Shaw.

An interesting discussion followed. Dr. F. W. Sears, of Burlington, Vermont, said that syphilis was a reportable disease in the state of Vermont, and that the law provided that the patient be warned that a fine of $500 was imposed in the event of further intercourse before he was pronounced cured.

Dr. G. S. Mundie, expressed the opinion that the Wassermann test should not be relied upon too closely as, especially in the blood, it was not infrequently negative; that in all cases a lumbar puncture should be made; and that the cell count and globulin test would often be found more reliable and easier to carry out than the serological one. In the tests carried out in the Royal Victoria

Hospital series, an increased globulin and cell count was found in almost every case even when the blood Wassermann was negative. In these cases the Wassermann on the cerebro-spinal fluid was also negative, but the colloidal gold test was positive and in his experience this last was a more delicate test than the Wassermann. In their series good results had been obtained from giving salvarsanized serum intra-spinally, and this was proven both by the clearing up of the symptoms, the Wassermann and colloidal tests becoming negative, and the cell count normal; the last thing to become negative was usually the globulin test.

Dr. F. M. Fry advised a method of treatment which he had been using in children for some time, and which he had found as efficient, rapid, and lasting, as any of the apparently more modern forms of treatment. This was the intra-muscular injection of a solution of perchloride of mercury, one grain to one ounce containing 2 per cent. sodium chloride. The needle is dried before injection and the solution does not touch skin or subcutaneous tissue. Up to 1 gm. is given to an ill-nourished infant several weeks old, placed deep in the gluteal muscle once a week. Indeed syphilitic treatment is known to be more rapidly efficient in the child than in the adult, requiring shorter courses. A local manifestation not touched upon in the previous communications was the Parrot paralysis which is due to a lesion about the spiral nerve, and gives a very typical paralysis which is far from rare, consisting of a flaccid paralysis of the upper extremity generally unilateral and with constant worm-like movements in all the fingers. These appearances can be definitely ascribed to congenital syphilis and give a better prognosis than a birth palsy would do. Pathologically a gumma of the periosteum is occasionally found, but in most cases only a syphilitic neuritis.

The fifteenth regular meeting of the Society was held Friday, May 2nd, 1917, Dr. W. S. Morrow, president, in the chair.

Pathological Specimens: Series by Dr. J. W. Scott.

The material which I have to exhibit this evening is from a patient who was admitted to the Montreal General Hospital complaining of dyspnœa and swelling of the lower extremities; he died two days after admission. He gave a history of chancre twenty-five years ago and pneumonia about three years previously; since this latter he had suffered more or less from breathlessness and swelling of the extremities, which became more marked about six weeks ago; was also troubled with cough. On admission he preferred the semi-recumbent position, face markedly cyanotic, visible pulsations of the vessels of the neck, respiratory excursions shallow but equal. Heart: accentuated pulmonic second sound, right border 3 cm. and left 15 cm., no murmurs. Lungs showed dulness at both bases, blowing breathing at the left base, moist crepitations postero-anteriorly. Abdominal cavity contained a little free fluid.

At autopsy the left lung is shown rough and the pleura a healing pleuritis, the anterior borders are markedly crepitant, emphysematous, and there are several large bullæ along the borders; scarring and fissuring is most marked here. The lung is heavier than usual and on palpation in some situations it is superficially quite firm; at other the firmness is more deep. Radiating fibrous strands averaging 1 mm. in thickness are most marked in the vertical situation. Repeated section showed no evidence of tuberculosis, no cavitation, caseation, no miliary or discrete tubercles. It is therefore a question whether this is a diffuse fibrosis following the pneumonia or whether it is due to syphilis. We are inclined to favour the latter view, although it is much more rare. We suspected syphilis at autopsy and blood collected at that time showed a serum diagnosis strongly positive to Wassermann. The tissue which we have stained specially in the endeavour to demonstrate tubercle bacilli is negative and no spirochætes are shown. In an extensive fibrosis such as this, one would expect to find the heart to be more or less affected. It weighs 690 grammes; the left side is about normal in capacity and dimensions, but the right shows a musculature remarkably hypertrophied, the wall twice its normal thickness and its capacity enormous. The right auricle is also very markedly increased in capacity. In situ the heart was a very pretty picture of broad heart engorged with blood. No valvular lesion was present.

This specimen of the lung is submitted not as an unquestioned case of pulmonary syphilis but rather as a probable one.

DEMONSTRATION: Dr. M. Lauterman exhibited several large calculi giving the clinical histories, procedure of removal and after-results, in the different cases.

CASE REPORT: Fragilitas ossium, by Dr. Alton Goldbloom. This paper was published in the *Journal* last July, page 636.

DISCUSSION: Dr. F. M. Fry: I do not believe that this condition has anything whatsoever to do with ricketts. As the trouble in this particular case began at the end of infancy, it is a pity the patient is unable to tell us whether he was a full term child or not, also about his feeding and nutrition in the first year of life. Years ago I had a chance to see a similar case at the other end of life in a very old lady in an Old Ladies' Home and her fractures appeared much more quickly than they were cured, a very slight turn in bed would be sufficient to cause a break. This I suppose, was caused by some lack in metabolism as was the present case.

Dr. Norman Viner: I have a family where there is quite a tendency to this condition though the parents are quite healthy. Two of the children died lately, one of poliomyelitis, one has tuberculosis and the other three, boys, have had five fractures between them, mostly of the clavicle, and all without apparent cause. Their sclerotics are not China blue, but they are somewhat tinted.

Dr. A. Goldbloom: I am very sorry I was unable to ascertain from the patient the nature of his feeding in infancy, but from the fact that he was a farmer and his parents were farmers it would seem that he probably was well nourished. With regard to Dr. Fry's case of the old lady there is quite a distinction between that form and the idiopathic. There is also a decided difference in the character of the bone; in fragilitas ossium the calcium is not deposited whereas in the senile condition it is rather excessive.

PAPER: The paper of the evening was read by Dr. W. J. Scott and illustrated with lantern slides by Dr. S. O. McMurtry, both recently returned from China. The subject of the paper was, "Medical conditions in China."

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THE TREATMENT OF NERVE, MUSCLE, AND JOINT INJURIES IN SOLDIERS BY PHYSICAL MEANS

BY R. TAIT MCKENZIE, *Major, R.A.M.C.*

Professor in Physical Therapy, University of Pennsylvania

CAREFUL analysis of four thousand cases returned from overseas during the period between July 12th and December 29th, 1916, shows that there were one thousand men suffering from gunshot, shrapnel, and shell wounds, five hundred from disorders of the nervous system, four hundred from injuries to bone, and four hundred heart and lung cases, excluding tuberculosis. Allowing for overlapping in this total of twenty-three hundred, at least 50 per cent. of returned men would require some treatment by electricity, hydro-therapy, radiant heat, massage, or muscular reëducation.

The sporadic wounds produced in civil life have been multiplied by war into groups. The exceptional has become the ordinary. Torn and mangled bodies have to be patched and remade, and functions, lost or weakened, must be gradually coaxed back toward normal by means that in pre-war days we often neglected or even despised. Old conditions have come up with new names, and new conditions have had to be met by a rearrangement and application of old means.

Before the war physical therapy was in the hands of a few enthusiasts in the profession, but when the need became urgent, a cry was raised throughout England and France for medical officers who knew how to apply it, and the war will not be an unmixed

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evil if by its means these physical agents are more closely incorporated in the future practice of medicine and surgery.

In the great orthopædic centres established throughout England by Lieutenant-Colonel Sir Robert Jones, inspector of orthopædics, in the sixteen or more command depots scattered over the British Isles by the director general, Sir Alfred Keogh, each housing more than four thousand men, these methods form the backbone of the treatment, and the Surgeon General of the United States has already sent over a contingent of orthopædic surgeons to make themselves familiar with the subject and to establish centres to accommodate thirty-five thousand cases in France.

Canada has not been unmindful of her responsibility to her returned men, and the Military Hospitals Commission is rapidly providing the staff and equipment necessary to bring back as many men as possible to usefulness in civil life.

While the conditions in Canada must, of necessity, differ from those in an English command depot, it is interesting to know that during the first six months of treatment in the command depot at Heaton Park about twelve hundred men (nearly 50 per cent.) were returned to the fighting line by this treatment alone, while another 30 per cent. were made fit for service on the lines of communication or more sedentary work at home, the average time spent by each patient being under three months. The details of this work I have described elsewhere (see *Proceedings of the Royal Society of Medicine,* 1916, volume ix, surgical section, pp. 31–62), but whatever the conditions under which the work is done, the means are the same, and the results are sure.

Briefly stated, the conditions to which physical therapy applies, are as follows:

1. Injury to peripheral nerves, all the way from the bruising of a nerve trunk to its destruction and restoration by surgical means. These injuries are accompanied by weakness or paralysis, muscular wasting, and contractures, conditions met by the application of wet or dry heat to keep up the circulation; support in proper position by splints, to prevent the overstretching of weakened muscles, and the resultant permanent contraction of those that are unimpaired; galvanic, and afterwards faradic, stimulation of the affected muscles; massage to keep up or improve their nutrition, passive movement to prevent contraction and limitation of the normal range of the joints; progressive active movements, joint by joint, to bring back and strengthen voluntary power, and later,

gymnastic and vocational training to fit the patient to fill with skill and efficiency his place in civil life.

2. Scar tissue, either in preparation for, or after operation. The bullet may leave a small entrance wound, but its course through the tissues may leave great areas in which muscle, fascia, tendon, nerve, periostium, and skin are matted together in one confused distorted mass, strangling the circulation and leaving the limb blue, clammy, moist with continual perspiration, and so painful that the patient winces at the slightest touch. Such wounds are treated by the whirlpool bath, which in twenty minutes changes the cold purple of the painful hand into a warm crimson, and enables the masseur to stroke, knead and otherwise move a joint in a way that no amount of persuasion would have made tolerable. The hastening of repair in these scars by diathermy and ionization, and the stretching of beginning contractures, by careful manipulation are among the triumphs of these methods.

3. Old septic wounds, long since healed, are frequently persistently painful, and a focus of infection may be discovered by massage. It is a frequent experience for a masseur to find part of a long scar become painful, then red, and finally to see a sequestrum or other foreign body extruded that would have lain for months a source of trouble, without the stimulation of heat and massage to hasten its removal. Naturally, such cases need most careful supervision, and a rough and unskilled operator may easily do more harm than good. Electricity, heat, and massage have thus a most important place in softening scar tissue, either before or after operation, and making the work of the surgeon easier.

4. In all post-operative conditions the cure must be completed by physical means. It is not enough to break down an adhesion or restore a joint to potential usefulness. Its nutrition must be improved, and the patient must be taught to use it. Even if it is possible to move it throughout its whole range a cure is not complete until the patient can do this himself with power and skill. He must be taken through a course of reëducation, beginning with free simple movements, advancing to those that are harder and more complex. Devices for this purpose must be designed and employed to prepare him for the more complicated actions required by the craft he may elect to practise.

5. Functional neuroses, which take the form of palsies, contractures, loss of sight, speech or hearing, areas of anæsthesia, or hyperæsthesia, show many marvellous cures by physical means. Contractures are slowly stretched and kept in place by splints,

systematically massaged and exercised by the faradic battery where voluntary movement cannot be obtained, and brought back to usefulness by a combination of hypnotism, suggestion, encouragement, and the gradual replacing of them by voluntary movement. The operator here must be both priest and physician, for the mental is even more important than the physical treatment, and these very real conditions, beyond the patient's control, in most cases, require persistent intelligent treatment, sometimes over long periods of time.

6. The conditions variously grouped under the name "shell shock" which vary all the way from minute hæmorrhages into the brain substance, caused by concussion, to fear and intolerable weariness must be treated by this means. When the soldier in the trenches begins to move his head rhythmically, to twitch his arm, or clutch at the sound of a shell, the regimental surgeon, if he is wise, sends him back to the rest camp for a week or two. If he is kept until the inevitable smash comes, his recovery will be a matter of months, at best, and he is usually put out of commission permanently. Tremors, coarse and fine, up to the point of a general convulsive seizure, rhythmic movements, increasing when the man is spoken to, and calming down when he is left alone are characteristic. Many of these men are martial misfits, never built for the enormous stress of modern warfare, and rapidly go to pieces under it. They usually present a history of nervousness, frequently with enlarged thyroid, rapid pulse and prominent eyes, and all such cases call for rest and sedative treatment, by the continuous bath at skin temperature (94°), hours of rest in bed daily, and the substitution of gentle massage and electricity for active movement at first, with a gradual increase of exercise, beginning with a slow walk and ending with gymnastic games and vocational training.

7. The "soldier's heart" is but a symptom of overstrain. The rapid pulse and breathlessness, the enlarged thyroid, all show the nervous origin of the conditions now known familiarly to medical officers as D.A.H. The faradic or high frequency current, the sedative bath, gentle massage and rest quickly reduce a rapid pulse rate and allow him to bear without danger, an increasing load in the form of gymnastic exercise, walking, and manual labour.

8. Debilities, whether due to typhoid, dysentery or exhaustion are built up again and made ready for service by graded exercises of effort, like light gymnastics, and of endurance like walking, until they can stand the amount of work to which they were formerly accustomed.

9. The place of physical remedies in the treatment of sprains and after fractures, in rheumatism and gout, in flat foot and other postural defects need not be discussed here. Enough has been said to show that the majority of the men who fill our war hospitals, command depots and convalescent homes must depend for most of their present treatment, and for their future efficiency, on the masseuse, the practitioner of electro and hydro-therapy, the physical instructor and the teacher of vocational training. The course usually followed begins with preparation by heat, either wet, dry, or produced by electricity, on through the stimulation of nutrition by massage and passive movement, then to simple exercise taken voluntary and eventually to skilled movements by gymnastics, games and handicrafts.

The equipment necessary consists of:

ELECTRICITY

1. The galvanic or continuous current produced by chemical means which causes no muscular contraction except when interrupted. The body contains a large amount of sodium-chloride and other salts in solution, and the constant current splits the salts into their constituents, the metallic portion being attracted to the cathode and the acid portion to the anode. Fatigue products may thus be sent on their way and the "refreshing" action of the current produced. It has a profound effect on metabolism, and salts of lithium, sodium and potassium can be driven into the tissues by its means, a method known as ionic medication. For painful conditions like neuritis, neuralgia and inflammation, the anode is applied, and for any condition requiring active hyperæmia, like Volkman's ischæmic contraction, the cathode is used. The interrupted galvanic current is of use in muscle testing where its chemical action on the muscle produces a sluggish contraction where no response to faradism can be obtained.

2. The faradic or alternating current produced by induction. This acts on a muscle very much like the normal nerve impulse in a healthy muscle. It is conducted along the nerve and enters the muscle through it, throwing it into a series of contractions, synchronous with the make and break of the current. It acts as a substitute when the normal nerve impulses are not fully conveyed to the muscle and can be used to increase nutrition and circulation in partial paralysis. It may be necessary to use both currents in some cases because the faradic does not touch those muscles or parts of muscles which do not respond to it, and the

galvanic may be necessary to reach them and give an even contraction.

These two currents are combined on a medical switchboard or earth-free pantostat, although the faradic is usually replaced by the sinusoidal, which is a current interrupted and reversed in such a way that its strength, starting at zero, rises in a curve to its apex on the positive side, declines to zero, and then rises in the same way on the negative side producing a series of sine curves on alternating sides. It is less painful than the usual faradic current. The faradic is given alone by small portable batteries, preferably of the Smart-Bristow type, and is of great value in exercising weakened muscles by graduated contraction.

3. The high frequency current used in diathermy is a current of high tension and small volume, produced by a special apparatus. It has no power to contract muscles, but produces heat caused by the resistance of the tissue through which it passes. It is useful in producing hyperæmia in parts where the circulation is deficient and as a preparation for a massage or movement. It causes an immediate sensation of warmth and has great powers of deep penetration.

Radiant Heat

Radiant heat is applied by means of electric lamps and causes a dilation of the surface capillaries, flushing the skin. It also makes an excellent preparation for massage in scar tissue, myalgia, and in joints that are stiff and cold or rheumatic. The most available forms are:

1. A lamp of about sixty candle power contained in a metal cone with a reflecting surface. This is moved about a few inches away from the surface of the part to be treated until the surface is well reddened, a process requiring three or four minutes.

2. Local electric light baths composed of six to twelve, sixteen candle power lights in a closed metal case lined by a reflector. The temperature is indicated by a thermometer and may be raised to 180°, the treatment lasting up to twenty minutes. It is especially valuable in painful rheumatic joints, myalgia, and sprains, and makes an excellent preparation for massage.

3. The cabinet, or full electric light bath, containing a large number of electric lights. In this cabinet a patient is completely enclosed except for his head. The temperature beginning at 100° is brought up to 180° and is indicated by a thermometer. Cold compresses are wrapped about the head and the treatment

lasts about thirty minutes. It is used to increase general elimination and is of value in all forms of intoxication—alcoholic, gouty, rheumatic, or nephritic.

HYDRO-THERAPY

1. Hydro-therapy plays an important role in the treatment of the wounded man, as it has the additional resource of cold as well as heat. The cases that derive most benefit from hot water are great areas of contracted scar tissue, painful stumps, weakened and stiffened joints. Slight adhesions may be broken down frequently after its use, and all parts are more easily manipulated.

Irritable bruised nerves are made worse by heat, so that for them baths should not be raised above 100° and manipulation or massage should never be used, the water should here act as a comforting poultice.

1. A sort of gymnastics of the circulation is given by the alternate use of heat and cold water in the Scotch douche or the local contrast baths, advocated by Sir Robert Jones.

2. The full sedative bath at 94° lasting for an hour is of great value in shock and in D.A.H. cases.

3. The whirlpool baths, first used in France during the war are the most valuable single appliance in the after-treatment of wounds. The arm or leg is plunged into a vessel containing water at about 105° which is circulated by jets, set at an angle, or by a propeller. Air is also introduced so that the limb is surrounded by a swirling bubbling current, the temperature of which is raised as high as 120° if the patient can bear it. The air bubbles increase the stimulant effect on the skin and the heat is applied to the surface far more surely by this means than if the water were still. These baths are particularly effective for painful stumps, painful scars, partial paralysis or in fact any condition which lowers the circulation and nutrition of the member. The period of treatment is about twenty minutes and the part, made warm and comfortable, is then ready for massage and manipulation, which could not have been performed without this preparation.

MASSAGE AND PASSIVE MOVEMENT

Little headway can be expected until the physiological effect of different forms of massage are clearly understood by both the physician and the masseur. Aimless rubbing is useless, and rough manipulation is dangerous, and frequently one form of massage may be good when another form is bad. Light stroking is especially useful in painful conditions and as a first procedure in a general treatment. It would be used about adherent scars, over effusions, and over surfaces in which the bone is close to the skin as in the scalp. It acts as a nerve sedative and as a mild stimulant to the surface circulation.

More vigorous friction reaches the deeper parts, wakes up the circulation and forces it on mechanically. Consequently its direction is usually the same as that of the venous circulation. In kneading, the skin moves with the hand like a glove, and large muscle masses are compressed and relaxed. Fatigue products are thrown into the circulation and the nutrition improved. This manipulation is specially useful in reaching deep scar tissue and in stretching it. None of these procedures should be followed by persistent pain.

Striking or beating is a surface or deep manipulation and is done in many ways. By it the nerves are stimulated and reflex contraction of organs like the heart and stomach is produced. Vibration is a rapid form of beating, given by a vibrator at a rate varying from five hundred to five thousand strokes to the minute. It is a stimulant to both nerve and circulation and in addition is most useful for stretching scars and tracing up nerve trunks.

Passive movements should be given by a trained operator, rather than by a machine. Their place is in the stretching of scars, increasing the range of stiffened joints and in rehearsing all the movements of joints whose muscles are paralyzed or weakened. They are of value in detecting and preventing beginning contractures.

Passive movements should not always accompany massage and may be contraindicated, as when a scar is incompletely organized. Here they may do great harm by breaking down the walls of vessels in course of formation in the scar and producing bleeding with subsequent further contraction. They should be slow and insistent, rather than quick and jerky. They prevent adhesions from reforming after an operation for fibrous ankylosis, and they can be used without an anæsthetic in breaking down adhesions when they are not too firm. In such cases the joint should be moved through its range once only, and kept at rest between treatments. It should never be worried by repeated and partial movements, but in the choice and extent of treatment, the surgeon must judge each case on its own merits.

ACTIVE MOVEMENT

Active movements may be free, but as a muscle works better against a certain amount of resistance, apparatus is necessary to measure the amount of work done and the distance the load is raised. Free movements are merely a rehearsal of the motions of which a joint is capable and need not be described in detail, but even if a limb is fixed by a splint, muscles can be twitched by the patient and so receive a certain amount of exercise, without any active movement taking place in the joints involved.

Most appliances for giving exercise are cumberous and expensive, and it has been our endeavour to design machines that would fulfil the following conditions:

1. To isolate the movement and so prevent the mistaken idea of improvement when it is really another group that is doing the work.
2. To record the range of movement, so that both patient and the operator can follow the progress of improvement.
3. To measure the dose of work in terms of the number of contractions and weight raised.
4. To be simple and cheap in construction, so that they can be easily made by a good carpenter, and discarded when no longer required.

With this in mind, crude appliances were designed and put in operation at Heaton Park in 1916, much experimentation has been carried on at Hart House, Toronto, and the Military Hospitals Commission has constructed a standard set at its workshops in Guelph, for use in hospitals throughout Canada.

They consist of the following appliances:

FOR THE UPPER EXTREMITIES

1. A finger board for stretching contractions and for giving abduction to single fingers.
2. A finger treadmill for voluntary flexion of single fingers against increasing weights.
3. Finger pulleys for flexion and extension of all joints of the finger against increasing weights.
4. Pulleys for thumb adduction and abduction against increasing weights.
5. A wheel for wrist circumduction, a stretching movement.

6. Pulley for wrist adduction and abduction against increasing weights.

7. A roller for wrist flexion and extension, against weights.

8. A handle for pronation and supination, against increasing weights.

9. A triplicate pulley weight with handles at the ground, shoulder height, and above the head, for exercising the elbow and shoulder joints, giving flexion and extension of the elbow as well as—

10. Shoulder rotation.

11. Shoulder adduction and abduction, flexion, and extension.

12. A creeping board for stretching the shoulder joint in abduction.

For the Lower Extremities

1. Inversion and eversion of the ankle, (a) against increasing weights, and (b) by walking on treads inclined inward and outward.

2. Dorsi flexion of the ankle against increasing weights.

3. Rotation of the knee in flexion, against increasing weights.

4. Circumduction of the ankle, a stretching movement.

5. Knee flexion and extension.

6. Hip adduction and abduction.

7. Hip flexion and extension.

(The last three given on the triplicate machine).

8. A combination of thigh flexion, knee flexion, and foot dorsi flexion by means of an inclined ladder.

9. A combination of thigh extension, leg extension, and foot plantar flexion by means of a bicycle trainer.

Each of these exercises is repeated up to the point of fatigue and the improvement is marked on the scale of specially designed protractors, and by measuring the weight lifted and the number of repetitions.

The operator should follow the patient through his entire treatment, beginning with the preparation by electricity, baths, or radiant heat. He should give the massage and passive movements and direct the active movements. When the improvement is sufficiently advanced, he can turn over the patient to the gymnastic instructor who groups him with a small squad for class gymnastic exercises, and to the instructor in vocational training.

GYMNASTICS

Gymnastics should be considered as part of the treatment in most cases whether the recovery is complete or not, a contracted finger or a stiff knee should not prevent the patient from doing most of the movements in a gymnastic table and the general exercise and discipline contributes to his cure. The two tables of Swedish remedial exercises, designed and already in use for convalescents, are arranged with no jerky or violent movements at first so as to avoid the possibility of injury from overstrain. As the patient improves, he may be given simple dancing steps to music and so progress to tag and other gymnastic games. The formal gymnastic tables are largely for discipline, accuracy, and control and should occupy but a small part of the hour, the rest being given over to games with medicine ball and basket ball, or such sports as handball, bowling or quoits. In this way discipline is combined with treatment and recreation and the man is prevented from forming those habits of idleness that unfit so many hospital patients for civil life after their discharge.

OCCUPATIONAL THERAPY

As soon as possible, men should be set at some occupation in which they will use the affected arm or leg, not consciously, but to accomplish some definite task. Driving a nail, pushing a saw, or handling a spade will supplement and soon replace the more accurate but less interesting work of the treatment room. The clumsy fingers become nimble, in typewriting, weaving, splicing or modelling and the practice of these trades must be regarded as important parts of one general and progressive system of treatment.

The success of physical means in the treatment in these conditions depends on well trained operators.

In Canada there are now two schools turning out graduates trained in the use of electricity, hydro-therapy, radiant heat, massage and corrective exercises, muscular and educational, and I trust this will be followed speedily by a course for the medical officers who will be put in charge of this important department of treatment. Such a course should consist of:

1. Orthopædics, to include the use of splints for all orthopædic conditions, the construction of shoes to correct foot deformities, the demonstration of nerve suture and tendon transplantation, the after treatment of stumps and the fitting of artificial limbs.

2. Electricity to include lectures and demonstrations in the use of galvanism, faradism, diathermy, and ionization; instruction in muscle testing.

3. Hydro-therapy to include demonstrations and practice in the giving of the douche and whirlpool bath, and the sedative bath.

4. Thermo-therapy to include demonstrations and practice in the use of the lamp and cabinet bath.

5. Massage to consist of demonstrations and personal parctice in each form of manipulation including passive movement.

6. Reëducation to consist of demonstrations and practice in the use of each of the appliances for reëducation provided by the Military Hospitals Commission.

7. Gymnastics to include practice in going through two tables of Swedish remedial exercises for convalescent soldiers, dancing steps and gymnastic games.

8. Observation and lectures on occupational therapy.

Such a course would prevent medical officers from being put in the false position in which they so often find themselves, of having to direct treatment with which they are not familiar.

THE News Bulletin No. 11 draws attention to the increasing prevalence of lobar pneumonia and the danger of infection in this disease.

THE USE OF EPSOM SALTS, HISTORICALLY CONSIDERED

By Colonel R. D. Rudolf,

Professor of Therapeutics in the University of Toronto

THAT there is nothing new under the sun is a common saying, and never was this truer than in regard to the use of that old medicinal friend, magnesium sulphate. This drug has, of course, been used internally as a mild hydragogue for many generations, but until recently, it would appear from modern literature, its external employment had not been thought of. Thus Dr. N. H. Choksy wrote in *The Lancet* of February 4th, 1911, "that the common and homely drug known as 'Epsom Salts' possessed any other property save the one usually associated with it was scarcely known up to within three years ago. The anæsthetic effects resulting from its subcutaneous application, however, induced Dr. Henry Tucker, of Philadelphia General Hospital, to apply it for the relief of pain in local inflammatory conditions, with rather surprising results. For apart from the relief of pain and discomfort, it was found that it controlled and eventually led to the cure of the imflammatory process. Numerous observations in gonorrhœal epididymitis and orchitis, gonorrhœal rheumatism, acute articular rheumatism, neuritis, etc., gave equally satisfactory results."

And Dr. Tucker himself, in the *Therapeutic Gazette* of April, 1907, and again in that of June, 1908, elaborates this external use of the drug and gives details as to its employment. Thus, a saturated solution should be applied to the inflamed part, 15 to 20 layers of ordinary gauze being constantly kept wet with it. The gauze should not be removed for twenty-four hours and the parts then washed and the dressing reapplied. There is found to be marked bleaching of the surface, which is not followed by any deleterious effects. It causes numbness and tingling in the hands of the attendants, which may last for twenty-four hours.

The external use of magnesium sulphate thus became established and since then has been much used and to my mind bene-

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ficially used in various superficial inflammatory conditions, especially, perhaps, erysipelas. But it can now be shown that this external use of the remedy is only an echo of the very ancient, in fact the most ancient, use of the salt. During the first years after the discovery of these waters they were only used externally, and it remained for the third Lord Dudley North to suggest that this all-healing drug might also be used internally with benefit. As is commonly known, the spring was discovered at Epsom, by a farmer called Henry Wickes, or Wicker, in the dry summer of 1618. This man happened to find on the Epsom Common a small hole containing water. He dug it larger and then brought his thirsty cattle to drink there, but the beasts would have none of it. This led to much talking and further examination of the well, and then someone suggested that it might be a medicinal water, and soon the local people began to use it as such in the bathing of various open sores and painful affections. This was the only use that was made of the well for years, until, indeed, Lord Dudley North, who lived somewhere near, began to take the waters as a medicine. In 1645 he published a book, called "The Forest of Varieties", and in it he claims to have been the first to have made known "the virtues of both the Epsom and the Tonbridge waters to the King's sick subjects, the journey to the German spas being too expensive and inconvenient to sick persons, and great sums of money being thereby carried out of the Kingdom." According to Nehemiah Crew, also, physician and secretary to the Royal Society, who wrote a treatise in 1695 on "*The bitter cathartic salt in the Epsom waters*", which book is in the library of the Royal Society of Medicine, where I had the chance of seeing it, Lord North was the first to take the waters as a medicine. He had been in the habit of visiting the German spas, as he "laboured under a melancholy disposition." He used it with success and regarded it "as medicine sent from Heaven." By 1688, according to Gordon Home in his "Epsom, its History and Surroundings", "it was a common occurrence for doctors to order a visit to Epsom, for in the "Domestic State Papers" of June 29th, in that year, we read: "Chatham Dockyard. John Owen to Pepys. I beg leave of absence for twelve days, being afflicted with ——— and advised to drink Epsom waters." Soon all the fashionable world was flocking to Epsom, and they continued to do so until in 1753 that popular physician, Dr. Richard Russel, introduced sea-bathing. The diversion in this direction was fatal to Epsom. Yet the Epsom well is still there, now surrounded by fruit trees, and the water still retains its original qualities. But where are the hosts of fashionable and more humble people who used to throng the London road, riding, driving, walking or being carried to the famous well?

A great Canadian military convalescent hospital, with its four thousand patients, is now nearby, and no doubt much "mag. sulph." is used in assisting these poor fellows back to health, but it is a salt made from *dolomite* or *kieserite* that is given, rather than the original waters from the adjacent well. And this is only used internally, unless, indeed, the medical officers have been reading rather recent medical literature and are applying what they, from this, believe to be the new external method, or unless, indeed, they happen to be versed in medical history and hence know that they are only then again employing what was the original method of using this healing solution in the very place where they are now practising their art.

In accordance with an Act passed last August to amend the Newfoundland Prohibition Act, a board of liquor control, consisting of three members has been appointed by the Newfoundland government. The powers of the Board include the supervision of the administration of the Act, the framing of rules and regulations for the purpose of carrying out its provisions, and the limitation of the quantity of intoxicants supplied to any one person.

ON THE MODERN METHODS OF THE TREATMENT OF FRACTURES

By Frank R. England, M.D., F.A.C.S.

Surgeon, Western Hospital, Montreal

THE treatment of fractures by reduction and splints is as old as antiquity. Read any treatise on fractures from the most ancient to the most modern, from Hippocrates to Ambroise Paré to Dupuytren, Malgaigne and Hamilton, and every one of them teaches that movement prevents the formation of callus and hinders bony repair. Based on this conception the principle governing treatment has been to effect reduction and secure immobilization, that is to say, secure good anatomical alignment of the broken limb and maintain it by splints and bandages. It was an easy method of treatment. It took but a short time for the surgeon or the local "bone setter", as the case might be, to "set" the fracture and then there was nothing further to do but to maintain a careless optimism, a watchful waiting for a month or two to see what happened.

Erichsen in his text-book on surgery says, "The treatment of a simple fracture uncomplicated in any way is a very simple business. All that the surgeon has to do is to place the fragments in proper position and in good apposition, and to retain them there, and attend to the general health of the patient on ordinary principles; nature does the rest. In no way can the surgeon accelerate the processes or improve upon them. By meddlesome treatment he may do much to retard and disturb them." But surgery is a progressive science and great have been its advances since Pasteur and Lister opened the door to the aseptic system. In cerebral and abdominal diseases the changes have been revolutionary, as, in fact, they have been in almost every field of practice. So also in the management of broken bones evolutionary changes were bound to come. The methods of mediæval surgery did not satisfy the keen scrutiny of such discerning clinicians as Brandenheuer, Lucas Championnière and Sir Arbuthnot Lane. A critical study of their own cases soon convinced them that the re-

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sults obtained were not satisfactory; on the contrary, a large proportion of the cases treated were marked by deformity and loss of function. It was apparent that the disability was largely due to prolonged fixation with splints and bandages; the nutritional changes, the ischæmia, the atrophy due to pressure, the thickening and stiffness of the neighbouring joints, the exudation into the tendon sheaths, the adhesion of tendons and the matting together of the surrounding soft structures, all these were recognized as being caused by prolonged fixation. In view of these evils Lucas Championnière had the courage to get away from authority, tradition, and routine and to try new methods. He began by lessening the degree of immobility, next he did away with it altogether and introduced the bold practice of methodical therapeutic mobilization, declaring that properly graduated movement instead of being harmful actually favoured the production of new bone.

This is the cornerstone on which his method of treatment is based. He taught that every movement which is not injurious by reason of its amplitude favours repair, but it must be understood that the movement must be measured—dosed so to speak.

The introduction of radiography also did much to add to our knowledge of fractures. It was of immense value in diagnosis, by giving positive information as to the nature of the break, the direction of the line of fracture, the amount of displacement, if any, of the fragments and their relative position. It also demonstrated the difficulty and often the utter impossibility of effecting reduction of the displaced fragments and retaining them in proper position. It was, doubtless, this difficulty of obtaining a good anatomical result which brought about the most modern of all methods, the radical treatment of fractures by open operation. Sir Arbuthnot Lane championed the method with all the enthusiasm and force of his strong personality. The practice naturally, for a time, received much hostile criticism; nevertheless, surgeons from all parts of the world flocked to London to see Lane do his bone plating, as a routine method in the treatment of simple fractures. To-day the practice has become almost universal, and may be seen practised in surgical clinics throughout the world.

With these three methods of treatment in mind and a right understanding of their underlying principles the surgeon must decide how best to deal with any particular case. It is now accepted as an established fact—"that good form and good function generally go together." This conclusion was arrived at by the

Fracture Committee named by the British Medical Association in 1912, after making a careful analysis of over three thousand cases of fractures treated by the operative and the non-operative methods. The report of the committee showed that with a good anatomical result, 90·7 per cent. gave a good functional result; with a moderately good anatomical result; 29·7 per cent. gave a good functional result; with a bad anatomical result, 53·3 per cent. gave a bad functional result. The committee's report concluded as follows: "Although the functional result may be good with an indifferent anatomical result, the most certain way to obtain a good functional result, is to secure a good anatomical result. No method whether non-operative or operative, which does not definitely promise a good anatomical result, should be accepted as a matter of choice."

I presume every practical surgeon, sooner or later with increasing experience, evolves for himself some basis or rule of practice. Personally, I must confess to a growing tendency toward the operative treatment of fractures, and this, notwithstanding my natural inclination to conservative surgery. Several factors seem to favour this line of treatment. In the first place one soon learns that the reduction or "setting of a fracture" where there is much displacement of the fragments is a myth, that it cannot be done even with the patient under an anæsthetic and on a proper table with good assistants to aid in the undertaking. The limb, it is true, may be made to assume a good anatomical position by extension and manipulation and the measurements may be right. In this so-called corrected position the limb may be held by splints or extension or by both; but later when the part is examined and checked by the *x*-rays the displacement will be found to persist either unchanged or not materially improved. When cases do come to operation it is generally found to be a very difficult matter to secure accurate coaptation and retention of the fragments even with an open wound with ends of the bone fully exposed to view. In such cases it is obvious that reduction by any other means would be an utter impossibility. Finally, with practice and a few special instruments the technical part of operative treatment becomes easier to execute and the operator has the satisfaction of knowing that the displacement has been overcome and the bony fragments firmly held in apposition. He soon gains confidence in technique and assurance of asepsis, the *sine qua non* of successful treatment. Whatever may be said for or against any particular treatment of fractures, it must be acknowledged that every method of treatment has some underlying principle to commend it in suitable cases. We should therefore familiarize ourselves with these various principles and endeavour to apply them rationally as the indications may appear to demand.

Here I wish to refer again to radiography and the part it plays in determining the management of fractures. A properly taken skiagram is of the greatest value to the surgeon in giving him accurate information regarding bony displacement, the position of the fragments, the involvement of joints, etc.; from such information he frequently decides for or against operative treatment. This is right and proper; nevertheless, the surgeon by deciding in favour of non-operative treatment may bring upon himself much trouble and annoyance. To illustrate, I will cite a case which came under my own observation. A young man, sixteen years of age, received a fracture of the middle third of the tibia. The *x*-rays showed only slight displacement with an angulation of not more than eight degrees. Treatment by splints and massage in due time gave firm bony union with a good functional result, so satisfactory that the patient was able to walk without a limp within eight months from the receipt of injury. On the return of an absent relative a skiagram was obtained of the injured leg. The line of fracture was still clearly shown with slight angulation. Much excitement ensued, "bone specialists" were consulted and operation discussed as a possible means of correcting the slight bowing of the tibia. The unfortunate surgeon was refused his fee and even threatened with a suit for malpractice. Such a situation may confront the surgeon any day. Under these circumstances the problem, which merits our thoughtful consideration, is how can we give our patients the treatment which is best for them, and not have our judgment and practice overruled by shadow pictures in the hands of well meaning, but misguided, friends? On this question I trust there will be some discussion.

In conclusion, I want to say a few words on the operative treatment of simple fractures. In my experience, if internal fixation is to be a success, the fixation must be mechanically efficient. Any method of fixation which leaves a weak and shaky junction is generally a failure. The fragments should be fixed mechanically, so that they can withstand all possible strain that is likely to be put on them. A fractured bone thus firmly and accurately fixed will heal by first intention.

I shall not go into details regarding the numerous devices which have been employed to secure internal fixation, for with these you are all familiar, but I wish to call your attention to the constriction band introduced by Professor Putti, in 1914, and perfected by Drs. Parham and Martin of New Orleans. It is particularly adapted for the internal fixation of oblique fractures of the long bones. The band is a good mechanical device, easy of application, and when applied restores the contour of the bone and gives firm and adequate security. I have used the band in only three cases, once in a fracture of the lower third of the femur, and twice in fractures of the tibia and fibula, and the results obtained in these cases have been most satisfactory with prompt recovery and early restoration of function.

MR. HORACE L. BRITTAIN, PH.D., has been appointed superintendent of the Toronto General Hospital for a period of one year. Dr. C. K. Clarke retains the position of medical director. Mr. Brittain is the managing director of the Bureau of Municipal Research and is well qualified for the work he has undertaken at the hospital. The enlistment of many of the members of the hospital staff has thrown a heavy burden upon those responsible for the administration and the new arrangement, it is hoped, will relieve them of a great deal of work which does not rightly belong in the province of medicine.

SOME COMMON FOOT CONDITIONS AND THEIR TREATMENT

By J. Appleton Nutter, M.D., F.A.C.S.

Montreal

CONDITIONS in the foot requiring treatment fall roughly into two groups, the first being where the foot is mechanically at fault, the second being due to some infection, most commonly dismissed as "rheumatism" and treated as such by salicylates and their derivatives. A combination of the two, mechanical defect plus infection, is very common and at the same time difficult to cure.

Among mechanical defects, trouble involving the longitudinal or long arch of the foot is the commonest presented for our treatment. This arch runs from front to back of the foot on its inner aspect, its highest point being marked by the navicular or scaphoid bone. Its function is to give an elastic tread to our walk—not to support our weight steadily and continuously. When too much of the body weight is applied to this arch pain results. The pain is due mainly to overstretching certain ligaments, that which supports the head of the astragalus (the inferior calcaneo-navicular) being most often involved.

I have said that pain results from too much of the body weight being applied to this longitudinal arch, but I have not indicated how this overloading of the arch comes about. The body weight may be considered as descending down the shin bone to the foot. If the foot is everted the shin bone will be directly over the inner border of the foot, and so the arch of which we are speaking will receive a great—an improperly great—proportion of the weight. If the foot is neither inverted nor everted the weight will be centered near the middle of the foot, and the outer border will bear much of the weight. This is as it should be, for the outer border of the foot is very strong and perfectly well able to support a great deal of weight.

That our arches are long-suffering is shown by the fact that troubles referable to them constitute by far the greatest number

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of foot complaints. The pain is most commonly referred to the inner aspect of the ankle, and tenderness is generally found over the scaphoid bone. The diagnosis is made by observing—not the height of the arch—but the fact that the foot is turned outwards more than normal, or is pronated. In advanced cases the arch becomes somewhat flattened—termed valgus. In many cases both conditions are present, so that the term pronato-valgus is frequently used. Bear in mind, however, that the pronation is much more significant and important than the valgus.

The commonest error in diagnosis is generally due to lack of observation. A heavy boot will often mask a pronated foot, and the patient is then treated for rheumatism. If there is one thing which it seems to me should be of value, one point to which I feel special attention should be drawn, it is that one should examine feet only when bared and with the patient standing. An examination of the foot with the patient seated or in bed leaves many points in doubt. One must not forget that in a doubtful case it is well to keep the patient standing barefooted for four or five minutes. I have seen an apparently normal looking foot develop well marked pronation in the course of a few minutes of weight bearing.

The next most common error of diagnosis in arch conditions is to overlook the actual presence of an infective process in the foot. The recognition, for example, of gonorrhœal arthritis or of tuberculous disease in an obviously pronated foot is not always easy. A rheumatoid condition may be suspected first of all by pains (actual pains) in other joints, as for example in the fingers. If in addition one finds in the foot swelling, pain and tenderness in regions not commonly affected by the results of pronation, and present to an extent unusual in mechanical disability, one may feel sure of the presence of an infection. Excessive swelling of the foot, particularly in the region of the toes, is likely to be due to rheumatoid disease.

In this connexion I wish respectfully to protest against the habit of inspecting the patient's fingers for Heberden's nodes, and on finding them (which is most common) to treat the patient's feet—all unexamined—for "rheumatism". If I had to consult a physician for suspected arch trouble I should enter his office with my hands in my pockets.

As to bone tuberculosis in the foot, in incipient cases it is impossible to be sure of your diagnosis. A tuberculous focus in or near the ankle almost always causes a pronated condition—usually rigid by muscle spasm—to develope. If you suspect such a condition by the presence of localized swelling and tenderness at a place not usually attacked in mechanical disability, put the foot at rest for a month or two in plaster-of-Paris until the *x*-rays make the case plain.

Strapping the foot in an inverted position makes a good therapeutic test. It generally helps a pronated foot, and has not much effect on the pain of rheumatoid or tuberculous disease.

Just as we say surgery is divided into two great periods, before and after Lister, so in the so-called arch conditions treatment depends on whether or not the foot is rigid. By rigidity we commonly mean inability to invert the foot—that is, to put into action the tibialis anticus and posticus. If a foot cannot be inverted it means, nine times out of ten, that owing to pain in the foot the peroneal muscles are contracted and cannot be made relax. If this spasmodic contracture of the foot has persisted for some months it will be found that adhesions between various joint surfaces have formed. In treating a rigidly pronated foot one has first of all to overcome the rigidity.

In a general way rigidity, which is practically always combined with eversion, is overcome by forcible inversion and then by retention for a longer or shorter period in an exaggeratedly inverted position. By inverting the foot the body weight is more largely transmitted to the outer and stronger border of the foot, and by so much the arch is freed from its burden. This explains why the so-called "strapping" of the foot gives so much relief. It is not due to any mystic healing imparted by the adhesive bandage—rather is it due to sparing the strain on the weakened arch by putting the weigh elsewhere.

Strapping the foot after it has been forcibly wrenched into an attitude of inversion is the best treatment in mild cases of rigidity. The procedure, which is quite painful, and unpleasant both to patient and doctor, should be repeated every day or every few days until the peroneal spasm is overcome and the foot can be voluntarily inverted. In many cases the painfulness of this manipulation causes it to fail, and here wrenching under an anæsthetic is indicated. Plaster-of-Paris in an inverted position is kept up for six weeks, to be followed by a simple brace remaining on a couple of months. Occasionally we meet with a rebellious case where, in spite of wrenching and plaster, the foot returns to its everted and painful position. Here it is a good plan to resect three-quarters of an inch of both peroneal tendons from back of the fibula near the ankle. Follow this with plaster in an inverted position for six weeks, and then with a brace to maintain the inversion while the patient walks. Plates are practically never needed in these rigid cases. The result of treatment is very gratifying, as a rule.

While on this subject of rigidity I should like to refer to a class of rigid feet occurring after sprain or fracture, particularly after Pott's fracture. Often after some severe injury to the leg or foot pain persists in the foot for months afterwards. In many cases this persistent pain is due to the fact that the foot has become rigid during its immobilization. This immobilizing is no doubt good, but the sad fact is that the foot, while encouraged to move itself up and down, is in many cases neglected as to its movements to one side and the other. Flexion and extension at the ankle are by no means enough to restore a foot to usefulness—it must have power of inversion and eversion or it will very likely remain chronically painful and tender.

I remember one case of a man with a fractured fibula who, months after the accident, was suing his employers for practically total disability. He was thought to have non-union of the fracture. He certainly *was* badly crippled, but the crippling was due to the fact that his foot was rigidly everted. My evidence was to the effect that in three months' time he should, with proper treatment, be well again, and if I remember aright it took only two months to give him a good foot.

Foot plates have a well defined sphere of usefulness in foot conditions. In my opinion there is nothing to equal the Whitman plate. The foot plate is particularly useful:

1. When speedy relief from pain is essential.

2. When the patient is too lazy or stupid to carry out the various special exercises to strengthen the foot and so do without a support.

3 In case of painful heels, where there is tenderness under the heel. Here a high arched plate relieves the heel of much of its burden.

4. In heavy individuals with feet too small to bear the body weight. This applies also to the feet in pregnancy, where under the weight of a heavy pelvis the feet give way. I do not think plates should be used when the following conditions are present:

1. In mild cases of pronation. Here strapping, raising the inner side of sole and heel, foot exercises and an intoeing gait should be enough.

2. In cases showing rigid or semi-rigid pronation. The peroneal spasm should first be got rid of as already described, and plates are unnecessary.

3. In cases with much swelling of the feet, inflammatory or otherwise.

4. In excessively painful and tender cases.

THE METATARSAL ARCH

Pain in the anterior or metatarsal arch (called metatarsalgia) is second in importance only to that found in connexion with the longitudinal arch. The pain is referred to the anterior part of the foot, including the toes, and there is tenderness in the metatarso-phalangeal joints. Squeezing the front of the foot laterally causes great pain. As a result of continued pain the toe extensors contract, so that the toes are nearly always kept drawn up in the air. This has the direct result of depressing the metatarsal heads still more, and one walks as it were on bullets.

Metatarsalgia commonly is started by too narrow shoes. Once it has become established, however, it takes more than a change of footwear to cure it.

The commonest type of metatarsalgia shows pain and tenderness in all or nearly all the metatarso-phalangeal joints, with hyperextension of the toes. Compression laterally of the front of the foot is very painful. If the pain is of recent date the toe extensors are not permanently shortened, but only in spasm. If the condition has lasted months or years you will find actual shortening and deformity, the toes flexed and drawn up into the air like hammer-toes.

If the foot shows no signs of active rheumatoid disease the treatment is comparatively simple. Beware, however, of cases where rheumatoid disease has settled in the already damaged foot, and beware still more of cases where there is neurasthenia, or where a lawsuit is pending. If all these conditions coexists the task is not an easy one.

Treatment. The best single method of treatment in metatarsalgia is a bar of leather one quarter of an inch thick and three quarters of an inch broad across the under surface of the sole of the shoe, just back of the metatarsal heads. Strapping the metatarsal arch, with a felt pad to elevate it, often gives great relief. The idea of the pad is similar to that of the leather bar, namely to relieve pressure on the weight-bearing end of the metatarsal bone. The shoes should, of course, be wide and thick-soled, the latter to prevent inequalities in the pavement from being felt.

Hyperextended toes with permanently shortened cords, should be let down by tenotomizing the extensor tendons. This allows the toes to assume their normal position and has proved of the greatest service in my experience. Hyperextended toes of themselves tend to render the metatarsalgia worse by forcing down the metatarsal heads.

Rheumatoid disease. Apart from baking, massage and restoring the anatomical form to the foot by this small operation, the presence of rheumatoid disease here, as elsewhere, means a search for the cause of the infection. This may be found in the throat, in the various accessory sinuses of the nose, in the intestinal or genito-urinary tract, as also in the teeth and gums. In connexion with the treatment of rheumatoid disease arising from tooth and gum infection I wish to acknowledge my indebtedness to Dr. A. W. Thorton, dean of the Dental Faculty of McGill. Dr. Thornton has helped to investigate scores of cases, and from him I have learnt how essential an *x*-ray examination of the teeth really is. I have little faith in an ordinary examination of the teeth, even by a good dentist. It needs an *x*-ray to reveal forgotten stumps, purulent cavities concealed by bridge-work, and deeply-seated abscesses.

One variety of metatarsalgia goes by the name of Morton of Philadelphia, who described it in 1876. The pain here is practically always referred to the fourth toe, and the tenderness to the fourth metatarso-phalangeal joint. The pain is sharp and agonizing, with increasing intensity, and can usually be made to disappear only by squeezing and manipulating the front of the foot after removing the shoe. The origin of the pain has occasioned some dispute, but it is probably caused by pressure upon the digital nerves by the head of the fourth metatarsal bone. A foot that is the subject of Morton's metatarsalgia will usually show little beyond a flattening of the anterior arch with hyperextension of the toes, especially the fourth. Sometimes there is tenderness in the corresponding metatarso-phalangeal joint.

How are we to treat it? Only too often strapping the metatarsal arch and the use of a bar under the sole of the boot fail to give relief. As a rule tenotomizing the shortened toe extensors and letting down the toes will cure the pain by allowing the fourth metatarsal head to assume its normal position. In the rare cases where this tenotomy fails, resection of the head of the fourth metatarsal is practically certain to give relief.

Shortening of the tendo achillis. In cases of marked shortening no mistake can be made, but it has been my experience that a mild grade of shortening is often overlooked. By a mild grade is meant where the foot can be forcibly brought to a right angle with the leg, but not beyond this. The shortening may be moderate in extent but far-reaching in its effects. A young lady from Quebec was brought to me complaining of pain and tenderness in her great toe joint. It had lasted for many years. She had no pain elsewhere and no trace of rheumatoid disease. I was quite at a loss to account for this until a routine examination revealed a short tendo achillis. When she took a stride forward the strain was largely transmitted to her great toe joint, which she was unable to raise from the floor.

Her tendo achillis was made about an inch longer a few months ago, and she has had no pain since.

In another case a young man consulted me because he walked lame. The limp apparently arose from the knee, and as a consequence this man's knee had been treated most heroically. He had, however, no pain, tenderness nor swelling in the knee, and *x*-rays of it were negative. The cause of his faulty knee action was finally found to be a shortened tendo achillis, which had the effect of throwing his knee backwards at every step. I operated on him a couple of months ago, and he is, I feel sure, to be free of his defect.

In a third case I had a sturdy little boy of ten brought to me for an examination. The complaint made was that he was continually falling and stumbling for no apparent reason. The boy was healthy and active and bright. Here again a routine examination revealed a short tendo achillis on one side. The dropped foot, naturally, was frequently a source of stumbling.

Let me close by noting that a shortened tendo achillis is at times the first and only sign of an oncoming degeneration of the spinal cord with extensive paralysis. I mention this because I know of one case where such a paralysis appeared after the tendo achillis had been lengthened, and the surgeon was given the blame for producing the paralysis. It is well in self-protection to warn the parents in such cases of the possibility of such an outcome.

CYCLIC VOMITING IN RELATION TO ACID INTOXICATION

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A GREAT amount of literature has been appearing during the past few years on the subject of acidosis in a severe form, called acid intoxication, as the cause of vomiting, fever, headache, dyspnœa, stupor, coma, convulsions, etc. My remarks will apply chiefly to the relation of acid intoxication to cyclic or recurrent vomiting. The term acid intoxication means the presence in the system of large amounts of acetone (CH_3 CO CH_3), diacetic acid (CH_3 CO CH_2 COOH), and beta-oxybutyric acid (CH_3 CHOH CH_2 COOH). Cyclic vomiting is a state in which spells of vomiting recur after certain definite intervals of freedom, which vary in length with different patients.

The chemical effects of the acetone bodies. Acetone itself is said not to be harmful when it accumulates in the tissues; but when it is present diacetic acid and beta-oxybutyric acid almost always accompany it. These two latter bodies, especially beta-oxybutyric acid, are harmful because they not only diminish the alkalinity of the blood, but, by combining with the alkalies, they prevent the conveyance of carbon dioxide to the kidneys and lungs. For example, when beta-oxybutyric acid combines with the ammonia compounds to form salts, it prevents the ammonia radicles from combining with carbon dioxide to form urea. The consequence of this chemical reaction is that carbon dioxide is left in the tissues, and an attempt is then made to excrete it by combining it with the potassium and sodium ions of the blood which carry it to the lungs and expired air according to the following formula:

$$CO_2+Na_2CO_3+H_2O=2NaHCO_3$$

(carried to lungs).

$$2NaHCO_3=Na_2CO_3+H_2O+CO_2$$

(escapes with breath).

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When the beta-oxybutyric acid increases still further and has combined with all the available ammonia radicles, so as to prevent the formation of urea, it then combines with the sodium and potassium ions preventing their combination with carbon dioxide to form salts for conveyance to the lungs. In such fashion a great accumulation of carbon dioxide is formed in the tissues and causes the vomiting and other symptoms above mentioned.

The causation of acidosis and acid intoxication. The reason for these acetone bodies appearing in some individuals rather than in others is not clear, and all we can say is that they represent an increased or faulty metabolism of fats. It is not difficult to understand why such bodies may appear in conditions which involve a great destruction of fats, such as fevers, starvation and diabetes mellitus, because in such states there is a more rapid breaking down of fats than in the normal metabolism. In the idiopathic cases with which we are especially concerned it would be reasonable to expect the acidosis to be aggravated or even excited by the feeding of fats or the withdrawal of carbohydrates which lessen the splitting up of fats. It is important to keep this influence of diet in mind when we come to the question of treatment.

Symptoms of acid intoxication. Usually for some hours or even days before vomiting or any other alarming symptom appears the patient may look tired and be fretful and irritable, and the breath may have the peculiar aromatic odour of acetone. The fact of this characteristic odour of the breath appearing so early and the fact that the acetone bodies may be demonstrated in the urine before vomiting occurs indicate that the results of faulty metabolism are responsible for the vomiting and other symptoms, and that the acetone bodies do not appear except as a result of the vomiting as stated by some investigators. When vomiting appears it is usually urgent and uncontrollable. The ordinary contents of the stomach are first vomited, then bile, and at times a little blood. For days nothing given by the mouth may be retained. Sometimes there is diarrhœa with a little blood or mucus in the stools, and this may suggest an intussusception or a volvulus for which an operation may be wrongfully performed. At other times there may be obstinate constipation. The vomiting usually ceases about the third or fourth day of the attack, but may continue for a week or more and when this obtains there is great thirst with sunken eyes and loose inelastic skin resulting from the loss of fluid from the tissues. The temperature is often elevated several degrees. When the vomiting ceases the acetone bodies usually disappear from the urine within a day or two, and reappear shortly before the next attack, which is likely to recur after an interval of several weeks or months as the case may be. In some cases there is the peculiar phenomenon of hyperpnœa or "air hunger" in which the breathing is deep and laboured, but may not be greatly increased in rate. In other cases there may be convulsions, fainting spells, or coma. According to some writers migrainous attacks may be symptomatic of the same condition. In fatal cases the liver cells have been found to be in a state of fatty degeneration. Necrosis of the renal tubules with hæmorrhages into the glomeruli has also been described.

Tests for acetone and diacetic acid in the urine. There is no good clinical test for beta-oxybutyric acid in the urine and it is usual to test only for acetone and diacetic acid. To test for acetone add an equal amount of urine to a saturated solution of ammonium sulphate in a test tube; then add a few drops of a weak solution of sodium nitroprusside. If acetone be present a deep purple colour appears. To test for diacetic acid add a few drops of a weak solution of liquor ferri perchloridi to some urine and a characteristic Bordeaux red appears. The dirty yellow precipitate is the insoluble phosphate of iron and may be filtered out. This latter test may be positive in patients taking salicylates, but in such cases the red colour does not disappear on boiling as it does with diacetic acid.

Treatment. The chief principle in regard to diet should be the withdrawal of fats and the increase of carbohydrates. During the attack sodium or potassium bicarbonate may be tried by the mouth or rectum in a one in twenty solution with the hope of increasing the alkalinity of the blood and supplying alkali radicles for combination with carbon dioxide. At times a small dose of morphine hypodermically or by the mouth or rectum will be found to be effectual in temporarily controlling the attack. The same proportion of sodium or potassium bicarbonate may also be employed in a 10 per cent. solution of glucose. In urgent cases 75 c.c. to 150 c.c. of a 5 per cent. solution of sodium bicarbonate in normal saline or a 2½ per cent. solution of glucose in normal saline may be given intravenously. When the patient is able to retain any nourishment milk sugar and cereal gruel should first be given and then light diet chiefly in the form of cereals.

The following cases illustrates the importance of making a thorough examination before coming to a conclusion, and also how essential is the application of scientific knowledge to treatment:

The patient, K. M., was seven years of age when she began to have severe vomiting. Previous to this she had been particularly healthy, and was considered to be more robust than her twin sister who had always enjoyed good health. The first vomiting spell commenced on the memorable day of August 4th, 1914, when Great Britain in defence of civilization declared a righteous war upon barbarous Prussianism. At that time the patient was spending her summer holidays in Muskoka with her mother and twin sister. The onset was quite sudden and severe. The vomiting matter first consisted of the ordinary contents of the stomach, but subsequently became green and then black. As the bowels were constipated a soap and water enema was given, but without result. On the next day, August 5th, the child was brought to Toronto, and on August 6th an abdominal section was performed. After the operation was performed the vomiting ceased. It was stated that during the operation a small intussusception had been found and reduced, but in the light of the subsequent history this statement is open to doubt. According to the mother the urine was not examined.

On November 2nd, almost three months after the first attack, another attack exactly similar to the first developed. On the next day an operation was performed, and the appendix was removed after which vomiting ceased.

A third spell commenced on February 28th, 1915, almost four months after the second one, and on March 1st another abdominal section was performed without finding any obstruction of any kind. Immediately after this the temperature rose to 103° and the pulse and respiration rates became accelerated. It was thought at this time that pneumonia was developing, but all the symptoms subsided within a couple of days. About two weeks later an attack of so-called broncho-pneumonia developed, but subsided inside of a week. At this time, for some unknown reason, the child was ordered a carbohydrate-free diet. Cane sugar was replaced by saccharin. Cream, butter, and other fats were allowed without limitation. Gluten bread and Roman meal porridge composed the remainder of the diet. It is instructive to note that the attacks now became more frequent and severe.

The fourth spell began on May 24th, less than three months after the third. At this time a laparotomy was again suggested, but the parents refused to give consent. On the third day the vomiting suddenly ceased, but it was several days before the patient regained her usual strength.

On August 3rd, a little over two months after the fourth attack the fifth spell commenced, and after continuing with frequent and violent vomiting suddenly ceased on the fourth day.

The sixth spell made its appearance on October 2nd, two months after the previous one and had the same character with the exception that it was even more severe. This attack also ceased abruptly on the fourth day.

The seventh spell began on November 28th, less than two months after the previous one and while the duration was about the same as the previous two the attack was the most alarming of all. A record of the number of times the child vomited was not kept, but it was stated that it was not uncommon for her to have five or six spells within an hour.

The parents now decided to take the child to a well-known American medical centre before the onset of the next attack which they expected about the end of January, 1916; but before they had completed their plans the child developed an acute attack of respiratory trouble on December 26th, 1915. It was at this time that I was asked to examine the child by a young medical practitioner who was a friend of the family. On examination the temperature was found to be 105°. The pulse and respiration rates were much increased in frequency. The breath sounds were very harsh, but were similar over the whole chest, and no adventitious sounds were present. Just previous to my examination there had been a slight vomiting attack. Being rather puzzled by the lack of physical signs, I was careful to make a detailed history and to examine the urine which was found to be loaded with acetone and diacetic acid. After about a week when all the symptoms had subsided, I ordered a complete reversal of the ingredients in the diet. The carbohydrates were permitted in abundance and the fats were prohibited. Proteins were allowed in small amounts. In a week or so after this change in diet the urine was entirely free of acetone and diacetic acid. *X*-ray photographs showed that there was no intestinal obstruction and that the barium meal moved onwards at a normal rate.

After this all was well for six months. On June 27th, 1916, while I was in Quebec on military duty, a telephone message was received saying that another attack had developed. Dr. G. W. Ross was summoned, and after a preliminary investigation he ordered a fluoroscopic examination of the gastrointestinal tract and a complete examination of the urine. According to his report there was reverse peristalsis in the duodenum and an abundance of acetone and diacetic acid in the urine. Enemata containing 15 minims of the tincture of opium were ordered as well as sodium bicarbonate by the mouth. In three or four days, when this attack had ceased the diet which I had previously prescribed was continued. On subsequently questioning the mother, no marked relaxation in the prescribed regimen could be discovered.

After the belated eighth attack all went well until September 8th, when a mild attack lasting about thirty-six hours developed. During this time vomiting occurred four or five times, and the urine contained acetone and diacetic acid. Since then the child has had no trouble of any kind and to-day is apparently in perfect health.

A day or so before the attacks the child usually showed a lack of the desire to play, and a whiteness was observed about the mouth and nose contrasting with the redness of the lips. A "sweetish" odour was noticed on the breath before and during the attacks. The appetite was always good and was not altered before the attacks. During every attack the temperature was elevated to 102° to 103°. Between the attacks acetone and diacetic acid were never found although frequent examinations were made. One important lesson to learn from this case is that no patient should be operated upon without first having an examination of the urine for sugar, albumen and acetone.

THE annual meeting of the Board of Governors of the Ross Memorial Hospital at Lindsay was held on November 1st. During the past year an *x*-ray plant has been installed in the hospital through the generosity of Mr. J. K. L. Ross. The number of patients treated in the institution during the year ending September 30th, 1917, was five hundred and sixty-eight, the average daily cost of maintenance being $1.81 per patient.

FOCI OF INFECTION IN THE TONSILS

By J. E. Hett, M.D.

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FOR more than a quarter of a century it was well known that a relationship existed between tonsillitis and rheumatism. At that time we were led to believe that the tonsillar trouble was caused by the rheumatism and the salicylates were frequently prescribed for tonsillitis and quinsey. The salicylates clinically gave good results in many cases, not on the tonsils, but undoubtedly upon the rheumatic trouble which would or did develop following the acute or subacute tonsillar condition. The profession, however, erred in putting the cart before the horse, for now we look upon the tonsillar trouble not as the effect of the rheumatism, but *vice versa.*

During the past six years considerable attention has been paid to the tonsils and a wave of opinion has been passing through the minds of the profession and the laity which no doubt will go to ridiculous extremes. It will be impossible in the short time here allotted for papers to go very deeply into the details of this great subject, or to present many arguments pro and con upon tonsillectomy both in children and in adults, so that it can be referred to but briefly.

It should be stated clearly that the indiscriminate removal of tonsils without sufficient symptoms should be avoided. The function of the tonsil is that of protection to the respiratory and digestive tracts in early childhood. In children it is only when the tonsil becomes abnormal in its size and causes obstruction to breathing that it should be removed. In those stages we have not a breaking down and a diseased condition of the tonsil as we find in later years, and whilst it is true that at times we frequently see acute tonsillitis in children with hypertrophied tonsils, I have not been convinced that these large growths should be completely enucleated when by the simple operation of tonsillotomy the desired results are usually obtained. Our literature is beginning to show the bad effects and mortality of tonsillectomy under

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anæsthesia, especially in inexperienced hands and that it is necessary to inform both the profession and the public that tonsillectomy is not a minor operation, but a major operation attended with risks.

Dr. Morris Manges reported six cases of pulmonary abscesses following tonsillectomy at the Mount Sinai Hospital, New York, in six months. Bassini reported nineteen cases of pulmonary complications after tonsillectomy and adenoidectomy. The pulmonary lesions being two cases of fœtid bronchitis, seven of bronchopneumonia, five of lobar pneumonia, three of lobar pneumonia and gangrene, one of purulent pleurisy and one of abscess of the mediastinum.

All of these were operated under a general anæsthetic. There is no doubt, and every reason to believe, that were the number of cases of fatality from hæmorrhage and lung complications known, "fools would not so easily rush in where the wise fear to tread."

After puberty and especially after adolescence the tonsils diminish in size and from this time on degenerative changes take place in the crypts, which become inflamed over and over again. The pockets become filled with various forms of infectious germs, particles of food may at times find their way into the pockets, especially after some of the crypts have broken down, and we simply have nests as it were of caseous material loaded with foul smelling particles which produce infection of the general system.

It is very common to find patients complaining of headache with more or less sore throat which lasts for a day or two and then passes over. After a few weeks or a month the same condition presents itself and the patient experiences the same trouble. At times the interval may be longer.

In a large number of cases the pain in the throat is very little and many cases have I found where the patient simply complained of the headache or backache and not of the throat. Close examination usually revealed the source of the complaint and infection.

In a large number of cases, however, the crypts are not seen to be infected, but with a good examination one is often surprised at the accumulation of cheesy, foul smelling products of decomposition that can be found especially at the upper angle of the tonsil hidden by the folds between the posterior and anterior pillars which can be expressed with the tongue well depressed and good pressure brought against the anterior pillar. When one sees the large accumulation it is generally easy to understand that infection must take place, and that patients must suffer with various disturbances in the system.

The conditions found due to systemic infections are numerous: arthritis, myositis, cervical adenitis, anæmia, thyroiditis, gastritis, and indigestion, tuberculosis, general malaise, etc. Arthritis is very common and it is surprising what relief is afforded at times when the source of infection in the tonsil is removed by enucleation, as illustrated by the following case:

Mrs. B., aged fifty-two, very pale and anæmic, suffered with the left knee, which was very much swollen for a year and a half. After seeking relief at various places she only became worse and could hardly step on her foot. Three months after the tonsils were enucleated she seemed a different person. She was able to walk pretty well, colour was restored to her face and she added a considerable amount to her weight.

It certainly is surprising what results will be obtained, especially in the cases of recurrent arthritis.

During the past six years I found that every case of cervical adenitis was due to infected tonsils. I believe that over 95 per cent. of cases are due to this infection. Before the technique of tonsillectomy was known, I operated on cervical adenitis and, of course, in some cases had recurrence. Later I succeeded in removing the adenitis, not by operation on the gland in the neck, but by enucleation of the tonsils. In cases when the adenitis was not of long standing it was surprising to see how the enlargement of the gland disappeared. Of course in old fibrous cases, or where suppuration has set in, the glands must be removed.

From observation of a number of cases of tuberculosis I found that the tonsils were in a diseased condition, and although I did not have an opportunity to examine the tonsils before the tuberculosis was discovered it seems to me that in all probability the tonsils were the breeding places of the bacilli of tuberculosis before general infection set in.

In quite a number of cases of anæmia and general malaise diseased tonsils are found—such has been my experience—and upon their removal the anæmia disappears. The following case illustrates this very clearly.

Mrs. F., aged thirty-two, had been in poor health for about three years during which time her weight decreased from one hundred and forty-five to ninety-five pounds. She sought advice and was under treatment by various physicians including a dilatation and currettment, although she had no symptoms of uterine disturbances. She simply grew from bad to worse, was very pale and anæmic.

Upon examination I found the tonsillar crypts in bad condition, and at the operation a large pocket of pus was located.

In a few months she had almost regained her original weight and soon returned to her normal condition.

The effects of infection vary a great deal, depending upon the nature and virulence of the microörganisms, the numbers present, the length of time, the absorption, and the relative immunity of the individual.

Whilst infection of the tonsils causes so many troubles one must remember that infection may be due to ulcerated teeth, pyemia, ethmoid and sinus disease and one must ever be on the alert to find where the infection exists. I have found it in the teeth and ethmoids as well as in the tonsils in the same patient.

The method which I resort to in the operation is by local anæsthesia entirely.

During the past six years the technique has been considerably improved. The tonsils are first swabbed with a 5 per cent. solution of cocaine and the surrounding tissue well injected with half of 1 per cent. of novocain and adrenalin. Great care must be exercised not to injure any of the small muscles and one must keep in close touch with the capsule at every part of the tonsils. Great care must be taken also not to remove too much of the membrane, as it is very essential in the healing process so as to cause as little contraction as possible.

In six years of enucleation I have had two cases of annoying hæmorrhage due to improper technique in the earlier operations, but by exercising greater care later I have practically had none.

Great differences in tonsils exists as everyone knows, and I have found that some small tonsils are often more difficult to enucleate than large ones and that experience and gentleness go a long way under local anæsthesia.

Many patients will say, "I can't stand anything in my throat and the slightest irritation produces gagging or vomiting." Everyone knows the great differences which exist in individuals and one must exercise considerable mental tact with firmness and gentleness to hold the confidence and keep the patient in proper condition during the operation.

As regards after-treatment a simple antiseptic gargle of weak solution of glyco-thymoline in normal saline is given, and usually I pay no further attention, believing that if the enucleation is properly done an excellent result can be expected.

NOTES ON THE TREATMENT OF BACILLARY DYSENTERY

By A. A. Fletcher, *Captain, C.A.M.C.*

Canadian General Hospital

THE following observations were made during the outbreak of dysentery which occurred among the Salonica Forces in the summer of 1916. The hospital was situated at the base and owing to difficulties in transportation, the cases were seldom seen for sometime after the onset. Yet while most of them had been sick for ten days or more, they were still having ten to thirty stools a day, consisting largely of the thick blood-stained mucus typical of the more advanced stages of the disease. The large majority were bacillary in origin and these notes were made upon a series of ninety-eight bacillary cases, in which I carried out a fairly constant routine of treatment.

A laboratory diagnosis was always made; seventy-eight were of the Shiga type and most of the other twenty belonged to the Flexner group. In the fall the dysenteries were nearly all infected with the Flexner organism, these cases were milder throughout and required very little treatment; they are not included in the above ninety-eight, which represents a series admitted between June 21st and October 10th.

The general treatment followed the lines usually laid down. An initial purge of castor oil was administered if it had not already been given. Sometimes an old solid stool would be passed by a patient, who for several days had been having stools of blood and mucus only. The oil was followed by repeated doses of saline, preferably soda sulphate, four times a day, for the first two or three days and then reduced as the stools became more fæcal. Dram doses were continued for a week or ten days if mucus was still present in any considerable amounts.

The diet first consisted entirely of various gruels, rice water, barley water, tea, and albumen water, to which lactose up to 4 ounces a day was added if the patient required further nourishment. The lactose was well tolerated and did not produce any

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nausea nor discomfort. As the dysentery became less severe, malted milk, jellies, eggs, and biscuits were added, but bread and other solid foods were not given until the diarrhœa had entirely subsided. Milk soured with *B. bulgaricus* was tried in many cases and with good success. Such a restricted diet seemed to be especially indicated during the summer months, while in the cooler weather a more liberal diet could be allowed without fear of relapse. Fluids were given freely by mouth at all times. In the more toxic cases 20 ounces of saline was injected intravenously once or twice a day, and this was done, if possible, even before any signs of dehydration had developed. Colonic lavage by means of small saline enemata gave a good deal of relief.

The polyvalent antidysenteric serum prepared by the Lister Institute was given to all of the ninety-eight patients. With the small doses often recommended, the results were not so well marked as with larger doses. Even in the lighter cases 60 c.c. would be given in the first twenty-four hours and in the worse cases as much as 80 c.c. were injected twice in the first day. As the response was more definite and less delayed when the injection was made intravenously, this method was almost always followed. As a rule in severe cases 80–100 c.c. were given the first day in a single or divided dose, 60 c.c. on the second and if thought necessary another 60 c.c. on the third. Further administration did not seem to have any influence on the course of the disease even when the blood and mucus were still present in the stool; this in itself emphasized the importance of a large initial dose. As has been pointed out by other observers, the important factor in the use of antidysenteric serum is early treatment and since in Salonica almost all the severe dysentery was bacillary, it was often found advisable to give the first dose without waiting for the bacteriological diagnosis.

The results bore out this conclusion. Twelve of the ninety-eight cases received a large dose of serum within four days of the onset. In seven of the twelve, the diarrhœa and the passage of blood had stopped and the mucus had practically disappeared from the stool six days after beginning the serum treatment, and of the seven, four had cleared up in three days. Thirteen received their first dose on the fifth, sixth, or seventh day, and of these five were similarly relieved in six days. In these few cases the effect of the serum was striking enough. The frequency of the stool decreased; the pain, the tenesmus and the rigidity of the abdomen was relieved often within twelve or twenty-four hours, the fever dropped to normal and the general condition of the patient was much improved. Convalescence, usually so tedious, was cut down to a comparatively short period. The remaining cases were tending towards chronicity when admitted, although the symptoms were still acute. After the disease had run a course of seven days the effect of the serum was slight, producing some temporary relief, but not shortening convalescence. After ten days the serum did not seem to influence the further progress of the disease in any way.

A few patients gave a history of previous attack and while in these the serum relieved the pain, the tenesmus and the toxic symptoms to a certain degree, it did not cut short the duration of the sickness.

During the summer the few Flexner dysenteries were often mild and cleared up well without serum. The severe ones, which received serum and are included in the series, did not react as favourably to serum treatment as those infected with the Shiga bacillus. For the laboratory reports I am indebted to Captain Duncan Graham.

THE twentieth annual meeting of the Board of Trustees of of the Royal Victoria Hospital at Barrie took place on October 31st. During the year five hundred and seventy patients were treated.

Case Reports

PRIMARY ASTHMA IN A PREGNANT MULTIPARA

By W. G. Hepworth

Steveston, B.C.

I CONSIDER the following case of interest. A Japanese woman, age thirty-five, consulted me in July, 1915. She was six months pregnant; her temperature was 100°, pulse 80, and she had a cough. No previous history of any sickness; other pregnancies were always normal.

Physical examination showed râles scattered all over the chest, in fact a mild bronchitis. I advised her to stay in the hospital (the Japanese have a hospital of their own here), but she refused and went back home across the Fraser River. I gave her an ordinary stimulating expectorant. I believe she went out fishing with her husband; three weeks later she came back unimproved, and agreed to stay in the hospital.

Her condition then was: Temperature 99½°, pulse 100, respirations 25, then for one month her condition gradually got worse, her temperature never went over 99½°, and was generally normal, but her pulse got weak and fast, respirations increased, she could not lie down in bed, had to be propped up all the time, and only when she had a hypodermic of morphine or morphine and hyoscine did she get some relief. Her case presented a typical case of pulmonary asthma, but it was continuous; there was only one attack and it lasted about a month. Several remedies were tried, as the iodides and bromides, but not adrenalin. She did not respond to any medical treatment. Her urine was periodically examined with negative results. I explained to her husband that I thought after the baby was born she would soon get well, but her case got so desperate something had to be done. I advised bringing on premature labour. Dr. Patterson, of Vancouver, saw the case with me in consultation. Her condition then was: Temperature 99½°, pulse 135, râles all over the chest, marked dyspnœa. Dr.

Read at the forty-eighth annual meeting of the Canadian Medical Association, Montreal, June 15th, 1917.

Patterson remarked that he had never seen a case like it, and as all the usual asthmatic remedies had been tried without effect he acquiesced in my decision of bringing on premature labour. The next morning I put her on the operating table and introduced two hollow rubber catheters into the uterus; one I blocked with sterile cotton, the other I overlooked and through it three or four ounces of fluid flowed out. I blocked it and packed the vagina, and she was put to bed. Almost immediately her symptoms improved, the catheters were left in situ for forty-eight hours without producing any pains. Her condition was so improved that I remember remarking pains would almost be certain to come on, but if not, I would not do anything more to bring them on. However, on the fourth day pains came on and she gave birth to a living child weighing less than five pounds. The baby developed an ischio rectal abscess when seven days old and was terribly jaundiced; I did not think he could possibly live, but at six months of age he was a fine robust baby. The mother has never had a day's sickness since.

I have no other comments to make on the case, except to emphasize the fact that her condition improved so remarkably before the uterus was empty and only three or four ounces of fluid drained out; I also was rather surprised that a soft catheter would puncture the amniotic sac as undoubtedly it must have done.

THE Canadian hospitals which were removed recently from the dangerous areas of Ramsgate and Broadstairs, England, have been established at Buxton, Derbyshire, where several large hotels have been taken over by the Canadian authorities for this purpose. The town of Buxton, well known for its mineral waters, lies in the heart of the Peak district in the midlands of England, and its climate is healthy and invigorating.

DR. CHARLES J. O. HASTINGS, medical officer of health at Toronto, has been elected president of the American Public Health Association.

Editorial

THE PHYSICAL REËDUCATION OF DISABLED SOLDIERS

THE recommendations made upon this subject by Major R. Tait McKenzie, R.A.M.C., while on active service overseas, may be said to have revolutionized the handling of the convalescent British Army. The principles upon which his work at Heaton Park, England, was conducted, and the remarkably successful results he achieved in it, may be gathered from a perusal of the paper by him published in this issue. This work attracted very wide attention and numerous editorials appeared upon it in the leading British dailies. As one instance of the practical results he obtained may be mentioned the fact that of two thousand men who had been already discharged from the Service in 1916 as physically unfit, over one half have been sent back to the fighting line. The class of men concerned are those who, after passing through the ordinary army hospitals, need special treatment, along the lines described in Major McKenzie's article, to bring them back to health.

Recognition of Major McKenzie's work by the Canadian Government together with observation of the success achieved here in Canada by workers in the Psychological Laboratory of the University of Toronto, led the Military Hospitals Commission to undertake the establishment here of extensive reëducation facilities for returned disabled soldiers. Major McKenzie was called in to make a survey of the Canadian Military Convalescent Hospitals, and has recommended methods by which standardization is being achieved and the work so broadened in scope, that hospitals from Halifax to Victoria will soon have workers and equipment.

In this connexion the valuable work of Dr. Edward

Bott, of the University of Toronto, has been recognized and the results applied by the Commission. He used a number of patients at the Military Orthopædic Hospital, Toronto, as laboratory material, and briefly outlines the general principles underlying physical reëducation in the *University of Toronto Monthly* as "the placing within the patient's reach the proper apparatus, assistance and encouragement for practising such physical movements or mental processes as may have been interfered with or have entirely disappeared, through injury or shock. Individual attention is the keynote throughout, each case being a study in itself."

In the experimental stage, following the plan of this Laboratory, an individual instructor gives his attention closely to each case and usually has to devise and construct a piece of apparatus by means of which the patient practises the particular movement or process impaired. It is a feature of each apparatus that a device is attached thereto whereby the patient may measure his accomplishment. Records are kept, and observation of the progress from day to day has a most encouraging effect upon the patient in bringing to the task his utmost concentrated effort. The overcoming of depression, by this means, is held to be a most important factor.

Last spring Lieutenant-Colonel Vincent Massey, one of the trustees of the Massey Estate, from whose funds the million dollar gymnasium and social centre building was erected on the University of Toronto campus, directed that as much of this building (Hart House) as could be used by the Military Hospitals Commission in expanding the scope of the reëducational work, should be made available for that purpose. The Commission resolved to make Hart House a training centre for workers, although active reëducation treatment is also being given to about sixty patients from the Orthopædic Hospital all the time. A school for masseurs and masseuses has been opened at Hart House, massage being an important corollary, and in accordance with Major McKenzie's report, arrangements are being made for the training of medical officers in reëducation methods. Over a dozen professional workers and instructors are now employed at this place, and between sixty and eighty pieces of apparatus, some of them ordinary gymnasium equipment, are in use. Under the standard methods now being evolved, there will be a close coördination of reëducation, massage, hydro-therapy, electro-therapy, mechano-therapy and physiotherapy. The manufacture of standard equipment as devised by the Hart House workers and approved by Major McKenzie is being arranged.

In all recent hospitals, planned by the Military Hospitals Commission, provision has been made for the adequate accommodation of facilities for carrying on this work.

Public confusion on the subject of reëducation has arisen, to a limited extent, through the use of the term as an abbreviation of vocational reëducation, which has been carried on in this country for some time. Soldiers disabled in such manner that they are unable to return to their former occupations are being reëducated in new trades. About ten per cent. of the convalescent soldiers passing through the hands of the Commission have required vocational reeducation.

VOCATIONAL REËDUCATION OF RETURNED SOLDIERS

PROBABLY the most important duty undertaken by the Military Hospitals Commission, now that the care of the returned sick and wounded has been taken over by the Army Medical Corps, is the provision of training for new occupations, of men, who, because of disability incurred on, or aggravated by, service, are unable to return to their former occupations. An interesting account of the work of the Commission in this connexion comes to us from an authentic source.

A man who, on account of his condition resulting from service, appears likely to be unable to go back to the work he did before enlistment, is examined by a Disabled Soldiers Training Board. This Board takes into consideration everything likely to help in a good choice of new occupation for a disabled man. It considers the man's own wishes, previous education, training and experience, his remaining ability and power, the best method of training, and the chances of permanent employment at fair wages after a man's training for his new job is complete. Recommendations are made by the Board in the light of all the information obtainable, and if approved by the Commission, the disabled man enters upon his course. The Board includes a medical man, a vocational officer and a man familiar with industrial and commercial conditions.

Very often the training commences during a man's period of convalescent treatment, during which, of course, he is still upon military pay and allowances. But if an approved course of training has to be continued after a man's military discharge, he comes under a special scale of payments for himself and his dependents. These payments vary according to the number of dependents and include pocket money of $8.00 per month and subsistence allowance of $1.00 per day for the man. To enable a man to get his footing after his training is finished, an extra month's payment is given to every man who completes his course satisfactorily.

The policy of the Commission is to train a man, as far as possible, for some new work in which his previous experience will be valuable. For one thing, very few adults can make a success of an entirely new occupation in competition with others who may have spent their whole life at it. If, however, a man is obliged to learn a new trade, no effort is spared to make him efficient and able to hold his own in the days to come.

Training in upwards of sixty different occupations is being given to disabled men in Canada. There are forty centres and sub-centres where training is provided by the Commission. Some men are also being trained in industrial shops and the coöperation of the C.M.A. has been enlisted to train a large number in this way under actual shop conditions, rather than in school shops; although, if necessary to do so, the Commission will supplement, by special classes, the shop training.

Fortunately, only a comparatively small number of men will require to be trained for new occupations, but the Commission has not confined its efforts to these men. Every disabled man who has to undergo treatment in a Convalescent hospital in Canada, is given an opportunity to take some training for self-improvement while he is a patient. Classes in various subjects are provided in or near all hospitals. A man may brush up his general education; study for the Civil Service; or learn bookkeeping, typewriting, shorthand, telegraphy, etc., at most of the centres. If these things do not appeal to him, there are drafting classes where a mechanic can fit himself for a better job; woodworking shops where a man can learn to become a handy man; automobile shops where a man can learn the care and operation of a car; shoe repairing shops where this very useful art can be acquired in a few weeks; machine and metal shops, etc., etc. Where there is ground available gardening and poultry work are also taken up. Many men have been enabled by this training to carry on successfully a back-yard garden and poultry run after their return to civil life. Many others have been able to better their positions because they have taken full advantage of the opportunities for improvement provided in some of the classes carried on during convalescence.

The Commission spares no pains to obtain first class men for this work and a large number of the instructors are men who have seen service in this war and are therefore able to understand the disabled man's feelings and afford him every possible help.

The view formulated by the Military Hospitals Commission as its profound belief must be seconded by every true Canadian. "Pensions alone, however generous, are not sufficient to pay the nation's debt and must be supplemented by sympathetic and efficient aid to enable the shattered to help themselves, to become once more conscious of and able to participate in the true joy of living, which comes only from useful and satisfying work."

GERMAN DRUGS AND MEDICINAL AGENTS AND THE CANADIAN MARKET

THE war has given Canada an opportunity to take such action as will prevent in future the exploitation of our markets by the farseeing but unscrupulous and unethical manufacturers and agents of German patent and proprietary drugs and medicines. Now is the time for the medical profession, both individually and through their various organizations and the press, to urge upon the government the necessity for instituting measures to protect the public and prevent a recurrence of abuses that obtained before the war. While medicine owes to German chemists many preparations of undoubted value, yet the debt is much less than their manufacturing houses and subsidized press would have us believe. Instead of the hardship which many foresaw at the beginning of the war from the cutting off of German drugs, most physicians will agree that the enforced return to pharmacopœal preparations has been of distinct benefit both to the medical profession and the public. In only a few instances has there been any real hardship and these will be more than counterbalanced by the successful efforts being made by manufacturers in Allied countries to meet future contingencies and the breaking for all time of German domination in drugs and chemicals.

The wide and indiscriminate use of German coal-tar products, sold directly to the public under catchy trade names, was a distinct menace to the health of the people and undoubtedly the cause of many fatalities. We refer especially to remedies sold for the relief of influenza, colds, headaches and insomnia—many of them dangerous cardiac depressants and in their continued use, capable of producing hæmolysis, anæmia and systemic disease.

Many German patent and proprietary medicines were sold in Canada under restrictions much less severe than obtained in the fatherland. Common drugs or mixtures were put up in fancy packages, under fancy names and sold at exorbitant prices. The prescribing of these by medical men, too indifferent or indolent to call for the same under their proper official names, aided and abetted the sale of the product of the farsighted manufacturer and assisted in familiarizing the public with their fancy names, so that they might later be purchased directly from the druggist without reference to the physician. The cloven hoof of *Kultur* is clearly in evidence, as one might anticipate, but what of members of our own profession who were so readily duped?

Unfortunately in providing substitutes for these German remedies, our own manufacturers are too frequently coining similar fancy names, and at times even copying the form of package in which the product was marketed. Imitation is surely the sincerest flattery, which the dignity and self-respect of our manufacturers should counsel them to avoid. One overlyshrewd Canadian manufacturer, before the war, coined a German name which he bracketed after the fancy name of his preparation, and notwithstanding subsequent events, he still appears to think it good business to conjure with the Teutonic talisman.

It is considered a breach of our system of ethics for physicians to prescribe patented remedies, yet these are often recommended by German authors in their text-books and have frequently been copied into our own. Such recognition by our profession of a dual system of ethics, manifestly to the advantage of German manufacturers, should never again be permitted.

The Canadian Proprietary and Patent Medicines Act is up for revision by the Dominion Parliament, and various Medical Societies have been asked to make representation in regard to proposed changes. This opportunity should not be neglected. The whole matter should be considered in a comprehensive and thorough manner in keeping with the interests and for the protection of the public.

The sale of dangerous products, except under prescription, should be prohibited; fancy names for common pharmacopœal preparations should not be permitted; a dual system of ethics should not be countenanced by the medical profession; exorbitant prices should be controlled, and in no case should the restrictions as to the sale of drugs be less stringent than obtains in the country of their origin.

In reply to a communication from the Academy of Medicine, Toronto, to the Patent Office at Ottawa, it was stated that "there has been no general suspension of patents granted to alien enemies, or suspension of any of the terms and conditions of the Patent Act in respect to such patents, but very broad powers have been given to the Commissioner of Patents under the Orders and Regulations respecting patents of invention, made and established under 'The War Measures Act 1914' to deal with specific cases." It is also stated that "three licenses have been granted. The first on November 28th, 1914, to the Synthetic Drug Company of Toronto for the manufacture of Salvarsan, the second on the same date to Dr. Archambault of Montreal for the manufacture of the same material, and the third, on July 12th, 1916, to the Vancouver Creosoting Company, Limited, for impregnation of wood or other porous materials. Four patents are involved in the first two licenses, and two in the latter license." Will the failure to denounce these patents facilitate the resumption of the old practices once the war is over? It is the duty of the authorities to shed some light on this important matter, and of the medical profession and loyal citizens generally to feel assured that their rights are being safeguarded. At present we have no such assurance.

THE CONNAUGHT LABORATORIES

THE Connaught Laboratories and the fifty acre farm which Colonel Albert Gooderham has so generously provided in order that research in Preventive Medicine and the preparation of serums and vaccines may be carried on, were formally presented to the University of Toronto by Colonel Gooderham on October 25th; and at the same time officially opened by His Excellency the Governor General.

The occasion was an unusual one and was especially significant in that the establishment of the first research foundation in Preventive Medicine was announced by Sir William Hearst. On behalf of the Ontario Government the Premier stated that seventy-five thousand dollars was to be voted at the next session of the legislature to endow research in Preventive Medicine in the new laboratories, and that the income from this fund would be devoted entirely to research, since the laboratories themselves were self-supporting. It was also announced that a sum of approximately twenty-five thousand dollars from another source was available and that the income derived from this, too, would be used for the same purpose. Thus the foundation at the outset amounts to about one hundred thousand dollars.

Research work will be undertaken to endeavour to provide means whereby the incidence of, and the mortality from, communicable diseases, may be lessened. The work at present being done on similar foundations at the Pasteur Institute in Paris, the Lister Institute in London, and the Rockefeller Institute in New York will serve as a model.

The opening of the laboratories was a very simple ceremony. The presentation speech by Colonel Gooderham, acceptance on behalf of the University by Sir Edmund Walker, the speech of His Excellency declaring the laboratories open, the important announcement of Sir William

Hearst, and a word from President Falconer constituted the programme of the formal part of the opening. Subsequently a moving-picture film was shown to illustrate phases of the work carried on in the laboratories; this was followed by a tour of inspection of the buildings where the various products of the department were shown, and finally tea was served. Adequate transportation and other facilities were provided. The guests included, in addition to those already mentioned, His Honour the Lieutenant Governor, members of the Provincial Government, the Board of Governors, the Bishop of Toronto, representatives of neighbouring Universities, representatives also of various interested governmental departments, both Federal and Provincial, members of the medical profession, and of the staff of the University, and friends generally of the new Laboratories. In the evening, in Convocation Hall, before a very distinguished gathering, Dr. Simon Flexner, director of the Rockefeller Institute for Medical Research, New York, delivered an extremely interesting and able lecture on the War Activities of the Rockefeller Institute. Dr. Flexner pointed out some of the important contributions to science which members of the Institute have made and are making, having especially in mind those of particular value in war-work in the saving of lives and in the minimizing of resultant disabilities. The University was extremely fortunate in having Dr. Flexner on this occasion as a lecturer. A very hearty vote of thanks to the speaker of the evening was moved by Dr. C. K. Clarke and seconded by Major J. G. Fitzgerald.

THE opening of the new sanatorium at Fort Qu'Appelle in the province of Saskatchewan supplies a long felt want in that province. Patients suffering from tuberculosis in the past have been obliged to go to the Ninette Sanatorium at Winnipeg or the Tranquille institution in the province of British Columbia, or to go across the border to the United

States if they wished to have sanatorium treatment. The buildings at Fort Qu'Appelle were commenced in August, 1913, and owe their existence to the efforts of the Saskatchewan Anti-Tuberculosis League, which was formed in February, 1911. In November of that year it was decided to erect a sanatorium in the Qu'Appelle Valley and a site was chosen on the shores of Lake Echo. The plans were prepared by Mr. J. H. Puntin, architect, and Dr. (now Major) William H. Hart, M.C., the medical superintendent. The construction of the buildings was interrupted for a time by the war, but the work was recommenced last spring. The necessary funds were raised through private subscription by the Saskatchewan Anti-Tuberculosis League, and by government assistance. The president of the League is Mr. A. B. Cook, who was elected in 1913 and who recently returned from service overseas.

Some weeks ago a circular was sent by the Committee of Public Safety for the Commonwealth of Pennsylvania to the retail druggists of that State, impressing upon them the necessity for more than ordinary care in ordering drugs, pharmaceutical supplies, and biological products during the period of the war. The increased demand for such commodities, coupled with the difficulty of obtaining them, both factors the result of the war, has made it imperative that waste should be eliminated wherever possible. Many of these preparations are subject to deterioration and are useless after a certain period of time. If a druggist therefore orders more than he can reasonably expect to use and takes advantage of the privilege of returning after a certain time what he has not used, valuable products are wasted and a loss effected which can be ill afforded, particularly at this time. It is pointed out that if only one package of any article is returned by a retailer, approximately fifty thousand packages would be wasted if each druggist were to do the same, not to mention the physicians and veterinarians who also use these products. The matter is one which might well be brought to the attention of physicians and druggists in this country.

The Ontario Government has commissioned Mr. Justice Hodgins, who recently conducted an enquiry into the practice of medicine in that province, to enquire into the present methods of dealing with the imbecile, feeble-minded and mentally defective of the province, with power to suggest amendments to laws now in force and measures which, in his opinion, will improve existing conditions. We understand that the Commissioner will also be instructed to enquire into the prevalence of venereal diseases, particularly in their relationship to the treatment of the feeble-minded, and will be empowered to suggest measures with a view to restricting the spread of such diseases.

An able address on health insurance was delivered before a number of medical men at the Toronto General Hospital on November 6th, by Professor Irving Fisher of the Department of Political Economy in Yale University. The war, Professor Fisher said, had placed a new estimate upon the value of human life and the losses in the present struggle made it all the more necessary that life should be conserved. Health insurance would increase vitality and should be brought about by medical men who made a study of industrial problems. When the men came back from the trenches after the war, they would make greater demands than ever before and in return for their patriotism and service would expect social insurance. The problem of an efficient democratic government had never been worked out satisfactorily but Canada had come nearer to a solution than the United States. Gratitude was an essential part of patriotism. From fifty to seventy-five per cent. of the poverty in North America could be abolished by insurance against sickness. Disease was the cause of poverty rather than poverty the cause of disease. The great preventive medicine of the future would be individual hygiene. Professor Fisher had himself been instrumental in founding a Life Extension Institute in New York, where employees were medically examined, told what was the matter with them and how to take care of themselves. Our health ideals would be raised by the war and a great deal would have been accomplished when the individual began to realize his responsibility to the nation as well as to his own family. The country must be awakened to the importance and the prevalence of degenerative diseases.

A JOINT meeting of the Educational Sub-Committee and the Women's Activities Sub-Committee on Venereal Disease took place in Toronto on November 7th. Major J. J. Mackenzie, C.A.M.C., of the University of Toronto, who has recently returned from England on leave of absence, gave an interesting address on the work being done in England by the National Committee for combating Venereal Diseases, which is under the chairmanship of Lord Sydenham. The movement, he said, was spreading all over the country and the Executive Committee was anxious to get into touch with committees such as the one recently formed in Toronto, with a view to collaboration and exchange of literature. By such collaboration and coöperation the movement, it was hoped, would eventually become Imperial.

The question of literature was discussed at the meeting and a sub-committee was appointed to go into the matter and submit a report. It was resolved also to organize a group of lecturers who might be called upon to speak at public meetings. It is probable that committees similiar to the one at Toronto will be formed in other places in the near future.

The Association

THE NEXT ANNUAL MEETING

SINCE the Montreal meeting in June of this year, at which it was decided to meet next year in Winnipeg, circumstances have arisen which make it inadvisable to attempt to hold a meeting in the West. After consultation with President-elect, Dr. McKenty, and the executive of the Winnipeg Medical Society, the whole matter was laid before the executive council of the Association, and it was the almost unanimous opinion that an invitation which had been received from the Ontario Medical Association to meet with them in Hamilton should be accepted.

At a conference held in Hamilton a few days ago, at which delegates were present from the Canadian Medical Association, the Ontario Medical Association, the Hamilton Medical Society, the Canadian Public Health Association and the Canadian Association for the Prevention of Tuberculosis, it was resolved that for the coming year all these Associations would hold their annual convention during the same week and as far as possible combine their several programmes into one. The profession in Hamilton have given a very cordial invitation which has been accepted by all, and the Ontario Medical Association which had already made considerable progress in the arrangement of their programme, has given up one of their days for papers by members of the Dominion Association. The last week in May beginning on the twenty-seventh of the month, and extending till June 20th, has been selected as the time for the meeting. The profession in Hamilton are very enthusiastic on the proposal, and have already made excellent arrangements for room space in the Royal Connaught Hotel; an hotel quite large enough to accommodate about five hundred guests comfortably. We are publishing in this number a sketch plan of the programme as it is proposed to be carried out. We may add that every effort will be made to secure interesting papers on live topics, and several of our former Canadian students who have attained prominence in the large teaching centres to the south of us, will be invited to take part in the proceedings. The executive council of the Canadian Medical Association, while they regret the decision of the Winnipeg Medical

Society, that it was not advisable to hold the meeting in Winnipeg this year, are hopeful that Dr. McKenty will still act as president of the Association during the sessions when the meetings take place under its auspices.

This will be Canada's Medical Week, and we hope that as many members of our profession as possible will endeavour to arrange their plans so as to be present at this meeting, which promises to be one of the most notable ever held in Canada.

OUTLINE OF PROGRAMME—COMBINED MEETING

Ontario Medical Association, Canadian Medical Association, Canadian Public Health Association, Canadian Association for the Prevention of Tuberculosis

Monday—9 a.m.	Ontario Health Officers
2 p.m.	Ontario Health Officers
	Canadian Public Health
8 p.m.	Ontario Health Officers
	Canadian Public Health

Programme and executive meetings to be arranged for by each Association.

Tuesday—9 a.m.	Ontario Health Officers
2 p.m.	Ontario Health officers
	Canadian Public Health
8 p.m.	Ontario Health Officers
	Canadian Public Health

Ontario Medical Association (Committee of General Purposes).

Programme and executive meetings to be arranged for by each Association.

Wednesday—9 a.m.	Canadian Association for Prevention of Tuberculosis
	Ontario Health Officers
	Ontario Medical Association (General Business Session)
2.15 p.m.	Ontario Medical Association (General Session) President's Address.

2.30 p.m. Canadian Association for Prevention of Tuberculosis. Symposium on Tuberculosis. Arranged for by the Canadian Association for Prevention of Tuberculosis.

8 p.m. Ontario Medical Association
Canadian Public Health
Canadian Medical Association

Symposium on the Returned Soldier Problem. Arranged for by our Military friends.

Thursday—9 a.m. Ontario Medical Association (Sections)
2 p.m. Ontario Medical Association, Canadian Medical Association } General Session
8 p.m. Ontario Medical Association, Canadian Medical Association } General Session

Programme arranged for by the Committees of the Ontario Medical Association.

Friday—9 a.m. Ontario Medical Association (Sections)
2 p.m. Ontario Medical Association, Canadian Medical Association } General Session
8 p.m. Ontario Medical Association, Canadian Medical Association } General Session

Programme arranged for by the Officers of the Canadian Medical Association.

Saturday—9 a.m. Hamilton Clinical Day
Medicine (Long Ward)
Surgery (Operating room)

Programme arranged for by the Hamilton Medical Society.

Miscellany

Correspondence

In the November number of the Journal we published a letter from Dr. J. W. S. McCullough, chief officer of health, of Toronto, in which reference was made to the price of diarsenol charged by the Synthetic Drug Company, of the same city. We have received from them the following reply:

Toronto, *October 22nd*, 1917

The Editor,

The Canadian Medical Association Journal.

Sir,—

Our attention has been called to a letter in your Journal in a recent issue from Dr. J. W. S. McCullough, chief officer of health, in which he criticizes the prices charged by us for diarsenol, particularly the retail prices. He also makes some references to the decision of the Commissioner of Patents in the application for a license made by him.

As to the prices charged by us, we might say that notwithstanding the higher cost of labour and material they are similar to the prices charged in England as fixed by the Board of Trade, and in fact are more favourable as the following comparison of the prices charged for a ·6 gram. ampoule will show.

	British	Canadian
To Government	5/–	1.25
To Hospital and Wholesalers	6/–	1.25 for lots of 1000
To Retailers	7/6	1.25 for lots of 1000
To Physicians	10/–	1.25 for lots of 1000

Our reductions are made according to quantity as follows:

Lots of 50	$2.00
Lots of 200	1.75
Lots of 500	1.50
Lots of 1000	1.25

We might say that about 60 per cent. of our total sales for Canadian consumption are at the lowest discount rate.

Before the war the German wholesale price in Canada for salvarsan was $2.10 and the retail price from $3.00 to $4.00 or more.

In view of the fact that all other commodities have risen in price and raw materials and labour are higher than they were three years ago, the physicians and general public have not very much reason to complain of our prices. The retail dealers may, and in fact do sell at less than $2.50 for ·6 gram. ampoule.

There is no agreement between us and the trade to maintain prices and the retail druggists are at liberty to sell at any price they like.

As we are manufacturers we have not the facilities and do not desire to do a retail business.

Before Dr. McCullough made his application for a license we offered to sell diarsenol to him or the Government at the rate of $1.25 so that he could re-sell it at any price he liked or give it away for free treatment.

From our experience we know that it is impossible to manufacture and sell diarsenol at a lower price without suffering a loss. It is only by reason of our foreign business and large output that we are able to keep our prices down to the present level. If the Board of Health were to manufacture for the Ontario or even the Canadian market only, they would lose money at our prices, which loss would have to be made up out of the public treasury. As a matter of fact the members of our firm have drawn no profits from the business and have not between them been able to draw a reasonable salary for their services.

As this question has been raised by Dr. McCullough and as it will be of interest to your readers to see exactly what the Deputy Commissioner of Patents decided, we give you his decision in full which is as follows:

"In the matter of the orders and Regulations respecting Patents of invention made under The War Measures Act, 1914, and

In the matter of Patents Nos. 133,636; 144,873; 144,874 and 152,320, and

In the matter of the application of John Wm. Scott McCullough, of the city of Toronto, in the county of York, Ontario, chief officer of the health, Ontario, on behalf of Provincial Board of Health, Ontario, for a license to make use of the inventions covered by said patents.

These patents which are held by a German company cover processes for the manufacture of a product known as "salvarsan" or "606" which is generally used in the treatment of "syphilis," being apparently the most effective agent therefor.

On the 19th June last the applicant filed an application for a license to use the inventions covered by these patents, basing the same principally on the following allegation:

That the difficulty or impossibility of procuring the articles included under the Patent Numbers referred to and their excessive price and the general interest of the public make it advisable that these articles be manufactured by the applicant who has adequate facilities therefor in the laboratories of the Provincial Board of Health.

On June 27th last the applicant appeared in person and was heard on his application as were also several members of the medical profession. In opposition to the application counsel appeared and were heard on behalf of the Synthetic Drug Company, of Toronto, and Major Gustave Archambault, M.D., of Montreal, to both of whom licenses to make use of these inventions had previously been granted.

In addition to their oral statements the several parties submitted in support of their respective contentions written memoranda, documentary evidence and other matter.

After consideration of the whole matter I have for the reasons hereinafter mentioned come to the following conclusions:

The outbreak of the present war cut off the supply of this product, which had previously been brought from abroad and it was found that the quantity available was very limited, quite inadequate for the country's needs, was held at a price practically prohibitive and that thereby owing to the great prevalence of the disease mentioned the public welfare was being seriously injured.

On November 28th, 1914, a license was granted to the above mentioned Synthetic Drug Company, composed of Ernest Neil Macallum and Charles Newton Candee, Junior, both of Toronto, to make use of these inventions and shortly thereafter they succeeded in placing on the market the product in question manufactured by them under these patents.

That since so first placing their product on the market the Synthetic Drug Company have constantly and continuously supplied this country's needs therefor.

The price charged by the Synthetic Drug Company for their product is $1.25 for the ordinary dose of 0·6 gram. or nine grains, in quantities, with proportionate prices for other doses, is reasonable and is practically the same as the price fixed by the British Board of Trade in licenses granted by them for the use of the corresponding British Patents.

Prior to the war the price paid by the wholesale trade in Canada for this product was $2.10 for the 0·6 gram. dose.

The Synthetic Drug Company are required under the terms of their license to pay to the Government in trust a royalty of 5 per cent. of the gross proceeds of the sale of their product.

The product of the Synthetic Drug Company is admittedly equal if not superior to the original "salvarsan" or "606."

The applicant has not satisfactorily established that he can produce this product more cheaply than he can obtain it by purchase from the Synthetic Drug Company.

The Synthetic Drug Company have invested a large amount of money in the manufacture of this product, have devoted a great deal of time and skill thereto and up to the present time have not been able to recoup themselves.

In view of the public service rendered by the Synthetic Drug Company as above mentioned the curtailment of their market by the granting of an additional license at the present time would be an injustice to them and the public interest would not be saved thereby.

It was apparent at the hearing that the present application for a license was for the purpose of enabling the applicant to control the prices charged by the Synthetic Drug Company rather than for the purpose of enabling him to manufacture the product.

The control of the prices to be charged by a licensee is vested in the Commissioner of Patents.

I am of the opinion that action on the application should for the present be suspended. If in consequence of a change in existing conditions the applicant should subsequently desire to be heard again and have his application reconsidered he may be given an opportunity.

Dated at Ottawa, this twelfth day of July, 1917.

(Sgd). Geo. F. O'Halloran,
Deputy Minister of Patents."

Thanking you for the space, we are,

Yours faithfully,

Synthetic Drug Company, Limited.

Book Reviews

MODERN MEDICINE AND SOME MODERN REMEDIES. PRACTICAL NOTES FOR THE GENERAL PRACTITIONER. By THOMAS BODLEY SCOTT, with a preface by SIR LAUDER BRUNTON, Bart., F.R.S. 159 pages. Publishers: H. K. Lewis & Co., Ltd., 136 Gower Street, London, W.C., 1916. Price 4/6 net.

A series of essays upon disorders of the heart, arterio sclerosis, internal secretions, and chronic bronchitis, which while they open no very new ground, are filled with sound common sense upon the management of disease in general practice, and written by a seasoned general practitioner tinctured with the spirit of James MacKenzie of Burnley—that was. A small book well worth reading.

THE BASIS OF SYMPTOMS: THE PRINCIPLES OF CLINICAL PATHOLOGY. By Dr. RUDOLPH KREHL, ordinary professor and director of the Medical Clinic in Heidelberg. Authorized translation from the seventh German edition by ARTHUR F. BEIFELD, Ph.B., M.D., instructor in medicine, Northwestern University Medical School, Chicago. Third American edition. 517 pages. Philadelphia and London, J. B. Lippincott Company, 1916.

This is one of the books which can not be readily ticketed in any of the usual categories. It is neither a treatise upon pathology, physiology nor symptomatology, but partakes in part of all three. In some sections one predominates and in some another.

One might have some regrets that the name of the former editions, "Clinical Pathology," had not been retained, in place of the one now given. But the present edition, as the former ones, is eminently a sane, sound and conservative exposition of the subject of Clinical Pathology, and though much new matter has been incorporated, notably in the sections upon Immunity and Renal Secretion, the author has been loath to "cast the old aside".

If one might venture a criticism, it would be at the retention of a number of time-worn discussions, and the tendency in some places for soundness to develop into prosiness, a fault inherent in any translation.

The book is well printed, and of convenient reading size, and has the important paragraphs in leaded type for ready reference. There is no other book just like it, and for the clinican it contains readily available matter not to be found elsewhere.

CATARACT: SENILE, TRAUMATIC, AND CONGENITAL. By W. A. FISHER, M.D., Chicago Eye, Ear, Nose and Throat College.

Fisher's book, for the most part, is a plea for the so-called Indian or introcapsular extraction of the lens as advocated by Colonel Smith of the Indian Medical Service. The essentials brought out are largely a repetition of technical points advocated by a few American surgeons who have obtained their experience first hand while in India.

The chief difficulty which the author is willing to acknowledge is that of loss of vitreous. Dr. Fisher has devised a special lid hook or retractor, which he uses instead of the usual eye speculum. This procedure apparently avoids spasmodic contracture of the lids upon the eye ball when once the cornea has been opened. The rest of the operation consists in dislocating the lens by means of the Smith hook by pressure on the cornea below, and by performing a version of the lens, delivering it in its capsule through a fairly large corneal incision.

A large series of cases performed by the author with excellent results would rather endorse this procedure; but the very noncommittal evidence of ophthalmic authorities in America would cause the ordinary surgeon to hesitate before adopting such radical measures, when equally good visual results are to be obtained by the older fashioned technique.

It has been recommended that the operation may be practised upon kittens; the author apparently has overlooked the point that cats' eyes and those of humans are in no wise comparable histologically, and that human vision is too valuable to experiment with after such preliminary technical experience. He also advocates sealing both eyes with a starched bandage and leaving it undisturbed for ten days after the operation. This would also appear as somewhat radical when statistics show that even in the more conservative operation iritis occurs in some form in almost half the cases operated upon, not to mention delayed healing of the wound, sepsis, incarceration of the iris and other complications.

The book, however, is a plea based on experience, and a reviewer is not entitled absolutely to condemn what he has not himself practised or seen practised. It is quite conceivable that the operation may be of distinct value for the removal of immature cataracts when working vision has been practically inhibited.

CONGENITAL WORD-BLINDNESS. By JAMES HINSHELWOOD, M.A., M.D., F.R.C.P.S., late surgeon to the Glasgow Eye Infirmary. Price 4/- net. Publishers: H. K. Lewis & Co., 136 Gower Street, London, W.C., 1917.

This is a most original and interesting work in word-blindness and leaves no doubt in the mind of the reader that the author has a full knowledge of his subject. The many errors in diagnosis of this condition have been carefully explained and simplified.

HYGIENE AND PUBLIC HEALTH. By LOUIS C. PARKES, M.D. D.P.H., University of London, lieutenant-colonel R.A.M.C., (temporary), consulting sanitary adviser to H. M. Office of Works; and HENRY R. KENWOOD, M.B., F.R.S., D.P.H., London., lieutenant-colonel R.A.M.C., (temporary), Chadwick professor of hygiene in the University of London. Sixth edition. 774 pages with illustrations. Price 14/- net. Publishers: H. K. Lewis & Co., 136 Gower Street, London, W.C., 1917.

This is an excellent account of the subject of Public Health as it is now understood. It does not purport to be a manual for the public health laboratory, and does not therefore give directions for the examination in any detail of water, air, soil, etc. It is thoroughly up to date in giving, for instance, a chapter on maternity and child welfare, and it has a chapter on school hygiene with valuable notes for inspecting officers. We are pleased to find that "draughts" and "chills" are treated of as real dangers. We should have expected some reference to the pioneer work in ventilation by the Rev. Stephen Hales. We would point out that the expression is "immune from" not "immune to" a disease.

A TEXT-BOOK OF FIRST AID AND EMERGENCY TREATMENT. By A. C. BURNHAM, M.D., instructor in surgery in the Polyclinic Hospital, New York. 298 pages with 160 engravings. Publishers: Lea & Febiger, Philadelphia and New York, 1917.

If a person cannot acquire the understanding of what first aid to the sick or injured means from this book, his is a "lost mind". Nothing so practical or succinct has been written on First Aid for a long time. Almost all the illustrations are beyond cavil. Everything is explained *ab initio*, nothing, not even the constitution of vinegar, is left to the imagination. The illustration of Schäfer's method for the restoration of the drowned is not quite extensive enough to explain the method to a person who never saw it performed.

POLIOMYELITIS IN ALL ITS ASPECTS. By JOHN RUHRAH, M.D., professor of pediatrics in the University of Maryland Medical School, and ERWIN E. MAYER, M.D., first lieutenant in the medical officers' reserve corps, United States Army. 276 pages, illustrated. Price $3.25. Publishers: Lea & Febiger, Philadelphia and New York, 1917.

This is a truly admirable work, a model of what a monograph on a disease ought to be. Aided by excellent illustrations, the more purely scientific problems are treated exhaustively, yet not pedantically. The volume opens with a history of the disease which apparently was not described for the first time before 1874.

The sections on treatment are as good as those devoted to the description of the disease. There is an excellent chapter on prophylaxis, the directions being well adapted to the comprehension of any person with average intelligence though without special training. The chapter entitled anatomical and physiological reminders is invaluable; we think it ought to have come much earlier in the book.

What is known on Poliomyelitis and is not in this book, is not worth knowing.

FOOD POISONING. By EDWIN OAKES JORDAN, chairman of the Department of Hygiene and Bacteriology, the University of Chicago. Price $1.00 net. The University of Chicago Press, Chicago, 1917.

The author deals with the subject of food poisoning in an interesting way. He takes up first the extent of food poisoning. He then takes up the sensitizing of protein foods. The poisoning from plants and animals is discussed. He then passes under review the poisons that may be added to foods such as the various poisonous minerals and food preservatives, and takes up the topic of food-borne bacteria. This little volume is a very useful addition to works on this subject, and is sure to find a place for itself.

PULMONARY TUBERCULOSIS: ITS DIAGNOSIS, PREVENTION, AND TREATMENT. By W. M. CROFTON, M.D., lecturer in special pathology, University College, Dublin. 119 pages with 20 illustrations. Price 6/- net. Publishers: J. & A. Churchill, 7 Great Marlborough Street, London, 1917.

Under the headings of bacteriology, anatomy, histology, physiology, methods of infection, pathology, diagnosis, prophylaxis, and treatment, the author attempts in this handy little volume to give an excellent resumé of our knowledge of pulmonary tuberculosis. In the treatment of the disease he advocates the intravenous injection of iodoform, beginning with a quarter of a grain every second day. He also gives a good deal of attention to the immunizing of people by the use of tuberculins. The book is quite interesting and will stimulate effort along these lines of treatment.

THE CAUSATION OF SEX IN MAN. A new theory of Sex based on clinical materials, together with chapters on forecasting or predicting the sex of the newborn child and on the determination or production of either sex at will. By E. RUMLEY DAWSON, L.R.C.P., London, M.R.C.S., England., late member of the Council of the Obstetrical Society of London and Fellow of the Royal Society of Edinburgh. Formerly resident obstetric house physician to the Westminster Hospital. Second edition with 22 illustrations. H. K. Lewis & Co., 136 Gower Street, London, W.C., 1917. Price 7/6 net.

This is a very interesting book and one that should attract a good deal of attention. It will be some time before the views set forth by the author can be either confirmed or set aside, or modified. The author states that the right side ova are intended to give origin to males, and he states that women prefer to sleep on the right side. He contends that this favours the entry of the spermatozoa into the right tube. This accounts for more male children being born than female. By cultivating the habit of sleeping on the right side, the number of males could be increased. The author deserves praise for the great amount of labour he has devoted to this subject.

Obituary

MAJOR R. H. BONNYCASTLE, C.A.M.C.

It was with the greatest regret that the news was received of the death of Major Bonnycastle, who succumbed to an attack of pneumonia on Sunday, October 7th. Dr. Bonnycastle had been in practice in Campbellford, Ontario, for eight years, when, in May, 1915, he went to England and accepted a commission as lieutenant in the Royal Army Medical Corps; two months later he went to France with the 15th Scottish Division. He was subsequently transferred to the Canadian Army Medical Corps, and, in August, 1916, was promoted to the rank of major. He returned to Canada in charge of a party of invalided soldiers and was appointed superintendent of training and hospital work at Valcartier Camp. A few months ago he returned to Campbellford to resume his practice. Richard Henry Bonnycastle was born in Seymour Township in the province of Ontario in 1881, the son of a pioneer settler in that district. He was educated at the Campbellford High School and received his medical training at the University of Toronto, where he graduated in 1905. The following year he began to practice in his native town. Major Bonnycastle leaves a widow and two children.

PROFESSOR G. L. SINCLAIR

Professor Sinclair, whose death took place recently at Jacksonville, Florida, occupied the Chair of Anatomy for some years in the Halifax Medical College, and later became professor of nervous and mental diseases in that institution. He was also Dean of the College for a number of years. George Law Sinclair was born at Norfolk, Virginia, about sixty-five years ago and was the son of a naval officer in the Southern Confederacy. He graduated from Columbia University, New York, in the year 1872. He was a brilliant lecturer and, as a teacher, won the affection and esteem of his students. In 1898 Dr. Sinclair was appointed inspector of humane institutions in the province of Nova Scotia and in that capacity instituted many reforms and improved conditions in the jails and county asylums of the province. He was also a strong advocate of the establishment of a provincial institution for the care of the feeble-minded. In 1899 Dr. Sinclair was appointed to the Medical Board of Nova Scotia as representative of the provincial government. He was also president of the provincial medical society. As superintendent of the Nova Scotia Hospital for the Insane, a post which he filled for many years, Dr. Sinclair endeared himself to all those with whom he came into contact by his sympathy and never failing patience, and it was chiefly through his influence that a nurses' training school was established at the hospital. His failing health made it necessary for him to give up active work a few years ago, but he never lost his interest in medical matters and always kept himself well informed of professional activities.

HONOURABLE T. S. SPROULE, M.D.

The death of Senator Sproule occurred at Markdale, Ontario, on November 10th. He had enjoyed fairly good health since his return to Markdale upon the prorogation of Parliament a few weeks ago, but had a seizure late on the evening of the 9th and passed away in a few hours. Dr. Sproule was born on October 25th, 1843, of Irish parentage, in the township of King in the province of Ontario, and graduated from the Victoria University, Toronto, in 1868. A few years later he settled in Markdale, where he had resided ever since. He had a long and notable parliamentary career and was generally recognized as leader of the Orange party. He was first elected to the House of Commons in 1878, and was reëlected at each succeeding election. In November, 1911, Dr. Sproule was appointed Speaker of the House, a position he occupied until December, 1915, when he was summoned to the Senate; at that time, with the exception of Sir Wilfred Laurier, Dr. Sproule had the distinction of being the oldest parliamentarian in the House of Commons. Dr. Sproule succeeded N. C. Wallace as Grand Master of the Loyal Orange Association of British America. He was also a member of the advisory board of the Liberal-Conservative Union of Ontario.

CAPTAIN ARTHUR M. FISHER, R.A.M.C.

Captain Arthur M. Fisher, R.A.M.C., who was killed in action in France at the beginning of November, was a graduate of McGill University of the year 1914 and at the time the war began was attached to the surgical staff of the Royal Victoria Hospital, Montreal. One of four Canadian surgeons sent to join the British Forces in the summer of 1915, Captain Fisher was appointed medical officer on a transport running between England and Alexandria. The vessel was torpedoed and Captain Fisher, though fortunate enough to escape with his life, lost all his personal belongings. Some time later he was invalided to England where he underwent a serious operation and, in the summer of 1916, when he was able to travel, returned to recuperate in Canada. The following autumn, however, Captain Fisher returned to England and subsequently to France where he met his death. He leaves a widow.

CAPTAIN KENNETH ANGUS MacCUISH, C.A.M.C.

Captain MacCuish, who died recently in a French hospital of wounds received while on duty at the battle front, went overseas with the St. Francis Xavier hospital unit, and, after serving for a short time in a hospital in England, proceeded to France. Captain MacCuish was about forty-three years of age. He was born at St. Peters and graduated from Dalhousie University in 1903 and some years later did post-graduate work at Edinburgh. He practised at Glace Bay for about fifteen years, then went to Dominion, and later returned to Glace Bay where he continued to follow his profession until he joined the staff of No. 9 Stationary Hospital. Captain MacCuish leaves a widow, who resides at Glace Bay.

Dr. John McRuer died at the Denver Hospital, Colorado, on October 31st, after a long illness, in the thirty-third year of his age. Born in Ayr in the province of Ontario, Dr. McRuer graduated from the University of Toronto in 1907 and practised for a time near Huntsville. The funeral took place at Toronto, on November 6th.

Dr. Hugh Ryerson Bright died suddenly at Athens, Ontario, on November 9th. Dr. Bright was born in Wellington County in the province of Ontario in 1884, and graduated with honours from the University of Toronto in 1904. After practising for a few years in Exeter, he went to Athens about two and a half years ago, where he built up a large connexion, his genial disposition winning him many friends. Dr. Bright leaves a widow and two little sons. The cause of death is thought to have been a bruise sustained in an automobile accident the day before his death.

Dr. Charles Merrill Smith died at Alberni, British Columbia, in October and was buried at Summerland, in that province. Dr. Smith was born in 1848 and graduated from the University of Toronto in 1870. He practised at Sault Ste. Marie, Ontario.

Dr. Robert Collison, of Edmonton South, died on October 20th, at the age of seventy-three years. A graduate of McGill University of the year 1878, Dr. Collison first went into practice in New York, but soon afterwards went to the West, settling in what was then the small village of Strathcona. There he continued his professional work, watching the village grow into the city and making himself beloved of his patients. He continued active practice until about a year ago, when his failing health made it incumbent upon him to give up his duties. He leaves a widow and an adopted daughter.

News

MARITIME PROVINCES

As a preliminary step towards the establishment of a health department as a branch of the New Brunswick Government, a survey of health and sanitary conditions in the province has been undertaken by Mr. John Hall, a graduate of the Massachusetts Institute of Technology. Mr. Hall will conduct an investigation into such matters as the public control and protection of food and milk, the slaughter houses, the sanitation of stores where food is sold, the existence of communicable diseases and methods of prevention, medical and sanitary conditions in schools, water supply and disposal of sewage. Mr. Hall will also submit a report on means of improving health conditions, the number of officers required to conduct public health work in an efficient manner, and the estimated cost of such an undertaking.

A number of cases of smallpox have occurred in certain districts in New Brunswick during the past month.

The main building of the Camp Hill Military Hospital at Halifax is now completed. It is beautifully situated and contains eight large wards, with accommodation for altogether seven hundred and fifty patients. Two additional wings and a vocational building are now under construction. The latter will contain class and lecture rooms, a garage and workshops, a bowling alley, and a theatre with a seating capacity of six hundred, provided with a stage and a motion picture apparatus.

ONTARIO

In presenting the report of the medical board of the Toronto Hospital for Incurables at the annual meeting of the Board of Trustees, Dr. F. C. Harrison, the medical superintendent, said that three hundred and twenty-four patients had been treated in the institution during the past year. Seventy-four deaths had taken place, of which twenty had been caused by cancer. There had been no cases of contagious disease. The financial statement showed an overdraft of $9,182.

A resolution was passed unanimously by the Toronto Ministerial Association on October 29th, pledging the whole-hearted support of the association in the measures taken against venereal disease and requesting the government to take the necessary steps to place such disease in the same category as smallpox and other infectious diseases.

Dr. F. N. G. Starr, of Toronto, has been elected second vice-president of the Clinical Congress of the American College of Surgeons.

The following is the list of communicable diseases reported in the province during the month of October: Diphtheria, 375 cases, 20 deaths; scarlet fever, 130 cases, 2 deaths; tuberculosis, 160 cases, 68 deaths; measles, 141 cases, 1 death; smallpox, 17 cases; whooping cough, 98 cases, 6 deaths; typhoid fever, 59 cases, 5 deaths; infantile paralysis, 14 cases, 4 deaths; cerebro-spinal meningitis, 2 cases.

The twenty-second annual meeting of the trustees of the Kitchener-Waterloo Hospital took place on October 23rd, when the resignation of Mr. J. B. Hughes, who has been chairman of the Board for many years, was accepted with regret. Mr. E. P. Clement, K.C., was chosen to take the place of Mr. Hughes, who was appointed honorary president of the Board of Trustees. During the past twelve months one thousand and fifty-nine patients have received treatment in the hospital; nine hundred and ninety-six patients were discharged and fifty-nine deaths occurred; there were ninety-one births in the hospital during the year.

At a recent meeting of the St. Thomas Medical Association it was decided that no prescriptions for intoxicants should be issued in future by members of the association.

Several cases of smallpox have been reported in Hawkesbury during the past few weeks.

QUEBEC

An outbreak of diphtheria and scarlet fever in October caused the authorities to close the schools at Sherbrooke for a few days.

MANITOBA

During the past few months diphtheria has been prevalent in several parts of the country. In Winnipeg a number of cases have been reported and at the end of the first week in October there were a hundred and forty patients under treatment in the King George Hospital. Among those who contracted the disease was Dr. W. J. Sharman, acting bacteriologist at Winnipeg.

SASKATCHEWAN

A meeting of delegates from the rural municipalities of Newcombe, Royal Canadian, Elma, Oakdale, Kindersley, and the town of Kindersley took place in October to discuss the by-laws and agreements necessary to permit of the establishment of a municipal hospital in that part of Western Saskatchewan. The by-laws will be submitted to the ratepayers at the annual elections this month.

A serious outbreak of diphtheria was reported in November from St. Louis, which lies about twenty miles south of Prince Albert.

BRITISH COLUMBIA

A grant of $10,000 has been made to the Kootenay Lake General Hospital by the provincial government.

MEDICAL COLLEGES

Toronto University

THE University Hospital Supply Association held its annual meeting on October 18th. Since March, 1915, the sum of $87,837 has been received by the association, and thirty-two thousand nine hundred and nineteen articles have been made by members and sent to No. 4 General Hospital.

ARMY MEDICAL SERVICES

CAPTAIN ROY COOTS, C.A.M.C., has returned to Toronto on sick leave. Captain G. Lockhart Gall, R.A.M.C., of Montreal, is also on sick leave. Captain Gall was wounded in the foot last August.

DR. T. W. WALKER, of Saskatoon, is attached to the staff of the Duchess of Cannaught's Canadian Red Cross Hospital at Taplow, and is in charge of cases of heart and lung affection.

LIEUTENANT-COLONEL GEORGE BADGEROW, C. A. M. C., formerly of Toronto, has been appointed consulting surgeon to the South African Eye and Ear Hospital at Richmond, England.

CAPTAIN F. B. GURD, who has been surgeon specialist to the 22nd Casualty Clearing Station, R.A.M.C., for the past two years, has been transferred for three months to Adler Hey Hospital (Robert Jones' hospital) Liverpool, England, to do special work there. Captain Gurd has just recently been made a Fellow of the American College of Surgeons.

DR. T. B. FUTCHER, of Johns Hopkins Hospital, has been gazetted lieutenant-colonel and posted as officer in charge of the medical service at the Ontario Military Hospital, Orpington.

LIEUTENANT-COLONEL C. H. GILMOUR has been transferred from the Canadain Officers Hospital, Broadstairs, to be officer in charge of the surgical service at the Ontario Military Hospital.

A NUMBER of changes have taken place in the personnel of No. 7 Stationary Hospital (Dalhousie University unit). Major

L. M. Murray has been transferred to take charge of the medical service at the Canadian Convalescent Hospital at Bushby Park. Captain F. V. Woodbury is now with the A.D.M.S. of the Third Canadian Division; Captain John Rankine is the medical officer to the 12th Field Ambulance; Captain M. A. Macaulay, who has been medical officer to the 4th Field Ambulance, has been invalided to Canada. Captain D. A. MacLeod is at present medical officer to the Princess Patricia Canadian Light Infantry. Captain J. A. Murray has returned to England and Captain J. F. Ellis (late speaker of the House of Assembly of the Province of Nova Scotia) has joined the Dalhousie unit; Captain A. H. McKinnon, a graduate of the University of Dalhousie, has also joined the hospital in exchange for Captain E. K. Maclellan, who was transferred to the St. Francis Xavier unit (No. 9 Stationary Hospital). Lieutenant S. R. Balcom also joined No. 9 Stationary Hospial, which is at Bramshott, England. Among the officers at present attached to the Dalhousie Hospital unit, of which Lieutenant-Colonel John Stewart is in command, are four of the original members of the unit, Captains Victor Mackay, K. A. Mackenzie, Karl F. Woodbury and W. Taylor. Those who have been transferred to the unit are: Captain A, M. Rolph, of Toronto. radiologist; Captain R. H. Ellis, of Ottawa, a Nova Scotian by birth; Captain W. R. Coles, of Prince Edward Island, who was in practice in Regina; Captain A. Arthur, of Winnipeg; and Captain Herbert Murray, of Owen Sound. Captain T. McGonigle and P. McQuillán are the present chaplains.

Captain J. M. E. Prevost, C.A.M.C., of Montreal, has been appointed medical officer of the Second Depot Battalion of the Second Quebec Regiment, which is under the command of Lieutenant-Colonel Daly Gingras, D.S.O. Captain Prevost has already seen service in France and has been twice wounded. He first went overseas with the Fifteenth Battalion, Toronto Highlanders, and afterwards transferred to the Twenty-second Battalion (French Canadian).

The Military Cross has been awarded to the following officers:

Captain Thomas Herbert, C.A.M.C.
Captain John Philip Selby Cathcart, C.A.M.C.
Captain Douglas Creighton, R.A.M.C.
Captain Franklin Fletcher Dunham, C.A.M.C.
Captain Emmet Andrew McCusker, C.A.M.C.

Captain Arthur Allan Parker, C.A.M.C.
Captain William Henry Scott, C.A.M.C.
Captain J. Charles Sutherland, C.A.M.C.
Captain James Walter Woodley, C.A.M.C.

CASUALTIES

Killed in Action

Captain Arthur M. Fisher, R.A.M.C., of Montreal.

Died of Wounds

Captain K. A. MacCuish, C.A.M.C., of Glace Bay, Nova Scotia.

Canadian Literature

The Canadian Journal of Medicine and Surgery, August, 1917:

Daufresne's latest improvement of Dakin's solution	C. H. Gilmour.

The Canadian Journal of Medicine and Surgery, September, 1917:

Trichloracetin acid in dermatology . .	W. H. B. Aikins.

Dominion Medical Monthly, September, 1917:

Typhoid fever in rural communities .	S. F. Millen.

Medical Societies

ALBERTA MEDICAL ASSOCIATION

The twelfth annual meeting of the Alberta Medical Association took place in Calgary, September 26th to 28th, 1917. The sessions were held in the well appointed rooms of the Board of Trade, and with two exceptions, the programme as arranged was carried out. The attendance was good, seventy members registering during the meeting,, and many important resolutions bearing on different aspects of public health and other matters were discussed and action taken. The Association strongly endorsed resolutions:

(a) Favouring the establishment of a separate Government Department of Public Health, having at its head a competent Deputy Minister who shall have special qualifications for that position.

(b) Favouring a propaganda of education of the public, with a view to controlling and limiting the spread of venereal diseases.

(c) Expressing strong disapproval of the grossly exaggerated statement made by Dr. Ritchie of Cochrane, Alberta, regarding the prevalence of goitre in Canada, and particularly Western Canada, in the following terms:

> "Whereas statements have appeared in the press of Alberta from time to time giving the impression that goitre is extremely prevalent in the province, and inasmuch as the statement has been made by certain members of the profession that from 50 to 100 per cent. of the population is affected by goitre; We, the members of the Alberta Medical Association, representing all the urban and rural districts of Alberta, desire to place ourselves on record as being of the opinion that goitre is not any more prevalent in Alberta than in other parts of Canada. We desire further to state that, in our opinion, there is absolutely no reason for anxiety regarding the spread of the disease. Further that we place ourselves on record as disagreeing absolutely with the statements made by Dr. Ritchie in his paper regarding the prevalence of goitre."

The meeting was from every point of view highly successful and the visiting members much appreciated the courtesy and splendid hospitality extended to them by their Calgary confrères during the sessions. The president, Dr. W. A. Lincoln, delivered the presidential address at the evening session of the first day. The meeting next year will be held in Edmonton. The president for the year 1918 is Dr. D. G. Revell, professor of anatomy, Alberta University, and the secretary-treasurer, Dr. T. H. Whitelaw, medical officer of health, Edmonton.

The programme was as follows:

WEDNESDAY, SEPTEMBER 26TH,—AFTERNOON SESSION:

Registration. Installation of Officers. Business.

Report of a case of anthrax with recovery.—Dr. P. M. Campbell, Lethbridge.

Osteo-myelitis of humerus.—Dr. F. J. Folinsbee, Edmonton.

Treatment of cystitis.—Dr. J. W. Richardson, Calgary.

EVENING SESSION:

Address of welcome.—Mayor Costello.

Address.—Mr. F. M. Black, Calgary Board of Trade.

Reminiscences.—His Honour Dr. R. G. Brett, Alberta.

President's address.—Dr. W. A. Lincoln, Calgary.

THURSDAY, SEPTEMBER 27TH—MORNING SESSION:

Case Report of posterior mediastinal abscess.—Dr. E. H. Reed, Calgary.

Paper.—Dr. R. B. Wells, Edmonton.

"Mesenteric thrombosis."—Dr. R. B. Deane, Calgary.

"An unusual case of infection."—Dr. J. L. Allen, Calgary.

Reports of committees, etc.

Lunch at Board of Trade rooms.

AFTERNOON SESSION:

"Report of case of superfœtation."—Dr. T. H. Crawford, Calgary.

"Spinal concussion."—Dr. F. W. Gershaw, Medicine Hat.

"Complications of gall-bladder disease."—Dr. E. W. Allin, Edmonton.

"The elimination of tuberculosis."—Dr. J. S. Wright.

"Quarantine of the minor infections."—Dr. T. H. Whitelaw.

EVENING SESSION:

Smoker.

FRIDAY, SEPTEMBER 28TH—MORNING SESSION:

"Congenital stenosis of colon."—Dr. J. S. Murray, Calgary.

"Some results of x-ray therapy."—Dr. G. H. Malcomson, Edmonton.

Business.

Auto trip about Calgary. Luncheon at Bowness Park, as guest of Calgary members.

AFTERNOON SESSION:

Symposium on Goitre:

"Goitre in Canada."—Dr. T. G. Ritchie, Cochrane.

"Etiology" (special reference to Alberta)—Dr. J. V. Follett, Calgary.

"Physiology of thyroid."—Dr. J. B. Collip, Edmonton.

"Pathology of goitre."—Dr. D. G. Revell, Edmonton.

"Medical treatment."—Dr. G. A. Anderson, Calgary.

"Surgical treatment."— Dr. C. E. Smyth, Medicine Hat.

THE KINGSTON AND FRONTENAC MEDICAL SOCIETY

THE Society held its monthly meeting October 15th, with the president, Dr. Mylks, in the chair. Through the kindness of Lieutenant-Colonel W. T Connell, the meeting was held in the electrical room of Queen's Military Hospital.

Major Mundell presented nine cases from the surgical wards.

Head injuries: Three patients were shown with injury to the vault with loss of bone. The first suffered from headaches, epileptic seizures, etc. The opening in the cranium was in the parieto-frontal region, four inches by one inch and a half, with its long axis parallel to, and about one and a half inches outside the midline. At operation several spicula of bone were found pressing on motor and sensory areas of the cortex. These were removed and the defect in the vault filled in by a transplant from the anterior surface of the tibia, following the lines advised by Morison (*British Journal of Surgery*, January, 1917). There has been no return of either headaches or convulsions and the graft appears to be in a healthy condition.

The other two head cases showed definite damage to the leg area of the motor cortex. In the one the paralysis was limited to the flexor muscles, in the other all the muscles were paralyzed.

Sciatic nerve injuries: A number of cases of irritative and of destructive lesions of this nerve have been under observation. One case of irritative lesion followed gun shot injury with compound fracture of the femur, the nerve becoming entangled in the scar. An operation had been performed in England with the object of freeing the nerve but without success, as the man has still marked hyperæsthesia of the limb below the lesion in the parts supplied by this nerve. So far, treatment has been of no avail.

The second case was that of gun-shot injury destroying the nerve about the middle of the thigh with resulting paralysis and anæsthesia. Nine months elapsed between the date of injury and his return to Canada.

Miscellaneous cases: 1. Scrotal hæmatocele; palpation revealed fluctuation; transillumination, by means of a pocket flashlight as practised in hydrocele, was impossible; a hypodermic needle showed blood.

2. Case of loss of pulley action of anterior annular ligament of the ankle.

3. Case of tuberculous cystitis and pyelitis.

4. Case of old empyæma which had cleared up with the use of the bismuth paste.

Captain Gibson showed a series of cases from the medical wards.

1. Shell shock: Two patients, who had been at Vimy Ridge, were shown. Both had been buried by shells. Both were unconscious when dug out and were deaf, dumb, and blind for three and seven days respectively, after regaining consciousness. These men are still quite nervous and excitable, with jerkiness of muscles, speech, etc.; reflexes markedly exaggerated. Both are recovering and are now able to feed and dress themselves, and take a few steps. A third case was shown who had been in a somewhat similar condition on admission, but is now able to walk about the hospital. Treatment in these cases has been largely by suggestion, the patients being assured that they would recover, that return to their homes would take place as soon as they could control themselves and that their services would not be further required in the present war.

2. Paraplegia: Two cases were shown, one functional, the other organic.

3. Partial heart-block history of rheumatic endocarditis; Wassermann negative, rate 40-42.

4. Case for diagnosis: Pellagra suggested. (The patient has an empyæma discharging through the bronchi as well as externally.) A sharply defined symmetrical erythema developed on the hands and face in early summer when he was wheeled out in the open air. At no time has there been burning or itching or vesiculation There is a moderate nasal seborrhœa. Disturbances of digestion have not been more marked than what might reasonably be expected from his primary illness. The man is somewhat depressed but shows no definite mental symptoms. Several physicians who had seen Box's case in London in 1913 discussed the diagnosis, but agreed that owing to the serious nature of the man's primary illness, the absence of definite mental features, and of disturbances of digestion, a diagnosis could scarcely be made. All agree, however, in the possibility of the case turning out as one of true pellagra.

Captain Asselstine described tests for ascertaining the functional activity of the kidney in nephritis The tests had been carried out on a number of cases of trench nephritis in the ward. The value of these tests will be discussed at the next meeting.

MONTREAL MEDICO-CHIRURGICAL SOCIETY

THE sixteenth regular meeting of the Society was held Friday evening, May 18th, 1917, Dr. W. S. Morrow, president, in the chair.

PATHOLOGICAL SPECIMENS: Series by Dr. C. T. Crowdy.

1. This specimen came to autopsy about six weeks ago and was from a female, aged forty-two, who had been quite well up to October, 1916, when she applied at one of the outdoor services for treatment. A diagnosis was made of bilateral apical tuberculosis, which was proved correct at autopsy. After a month's treatment she developed difficulty in breathing which at the time was diagnosed as due to a tuberculous ulceration of the larynx. Treatment was kept up for several months with little or no improvement and in January, 1917, difficulty in swallowing began, at times worse than others. Before admission to hospital in March, the patient had not been able to swallow anything for three days. On making a physical examination it was found that there was a slight degree of exophthalmos with nervous symptoms and the thyroid gland on the right side was slightly enlarged and nodular. A diagnosis was then made of carcinoma of the thyroid gland and she was operated upon; and the right half was found to be

involved and was removed. About ten days later she came to autopsy. In the meantime microscopical sections had been made and it was found that this was not primarily of the thyroid but a growth in the œsophagus which had invaded the thyroid gland and also the trachea with ulceration. For that reason I thought the specimen rather interesting, showing not only in the œsophagus the ulceration but in the trachea, about an inch below the vocal cords, a perforated ulcer which had given the symptoms in the fall. It shows how hard it would have been to make a correct diagnosis as this ulcer is quite low down and she had a definite tuberculosis of the lungs as well.

2. This specimen shows what commonly occurs in accidents,—an extensive injury to one of the visceral organs without external marks. The patient, aged thirty-two, was apparently in good health when he was knocked down by an automobile and rushed to hospital in a state of collapse; externally there were only a few scratches and bruises but it was evident that there was some serious internal injury. A diagnosis was made of rupture of one of the visceral organs and it was thought to be probably the spleen. At operation, however, the abdomen was found full of blood and there was a large laceration of the liver. This laceration was so extensive that hardly anything could be done except to try and stop the bleeding by packing with gauze. The patient died next day and this specimen shows what an extensive laceration had occurred with so little external sign.

3. An omental femoral hernia. This specimen is of interest because of its appearance. It is a very simple thing but looks very much like malignant tumour and might be easily taken for thyroid, ovarian or other growth, but in reality it is simply an omental hernia. It was removed from a lady aged fifty-eight years, operated on last month, having had for twenty years a right femoral hernia for which she had worn a truss. It had not bothered her much until lately when it had been growing larger. A fortnight before admission it could not be reduced and she entered hospital for relief. Sections from the mass removed simply show fat; there is no bowel.

Discussion: Dr. M. Lauterman: These two very interesting cases recall similar ones I have had. The case of malignant disease recalls a case I saw many years ago in which two pathological conditions existed together and it is very confusing when one has two conditions co-existing. A gentleman had an apical tuberculous lesion and in addition had specific disease of his larynx; and as it was before our technique was as good as it is now, the Wassermann test, etc., being unknown, the difficulty of diagnosis was evident. This brings home to us the fact that two conditions may exist in one case. The ruptured liver case is interesting and it is far from uncommon to have cases where externally there is little or no sign, whereas there may be severe internal injury. I recall the case of a boy, in 1900, who while looking after horses got kicked in the abdomen. He had nothing but the mark of the horse-shoe on his abdomen, the skin was not even broken, but the intense shock made one feel that there was something very serious going on; we brought him into town and found a ruptured kidney and, very fortunately, the boy got well. It is astonishing how little external evidence there is in some of these cases of very severe injury in the abdomen. Cases are recorded in which the bowel was ruptured but there was nothing but the intense shock to show that serious injury had been sustained. This shock therefore is an important point.

Papers: 1. "Modern methods in the treatment of fractures, with illustrative cases," by Dr. F. R. England. (Published in this issue.)

Discussion: Dr. Geo. Fisk: I had the pleasure of assisting Dr. England particularly with the thin band and it appears to me a very practical thing for any oblique fracture of the long bones. With a proper fracture table it is very easy to extend the fragments and pass this band around, and it is then merely a matter of tightening up and extending at the same time. Once the band is tightened it is an easy matter to catch it up in the slot and the limb is then quite firm; once it is applied it holds very firmly. It is a method that has come to stay and has advantages over the plate and screws and the other system of simply driving screws through the bones. One of the points that I think is an improvement is that there is much less chance of its becoming loosened. When the screws and the plate are employed, a very little inflammation may cause the screws to loosen and the plate to shift. With the band any movement that may occur is not enough to damage the formation of bone or cause excessive callus but rather stimulates circulation and encourages healing. Another point with fixation by either the band or the plate, is that it allows one to apply massage very much earlier in the case and promotes nutrition about the bone and limb.

Dr. A. E. Garrow: The Society is to be congratulated on the excellent paper Dr. England has given to-night on a very important subject. He does not mention in the paper, however, some of the disadvantages of the various forms of treatment which he discussed. The first of these, and one which I am glad to say seems to be becoming less frequent, is the treatment of fractures by splints and one of the unfortunate complications which follows this method is Volkman's paralysis. From hospital experience the application of splints by the general practitioner is much better than it was four or five years ago. This idea of plating above and below and without fixing the fractures or attempting to hold them in position is becoming well understood. With respect to the band which has raised such a good testimony, when I had an opportunity of seeing this band it did not appeal to me except for instance in fractures of the femur where the diameter and the contour of the bone is more or less uniform. Applied to the lower end of the tibia, the upper end of the ulna, or the lower end of the femur, it is rather difficult. Owing to the mechanical arrangement of the band into the slot, particularly where it is a pyramidal shaped bone, the tightening will be largely string-like in its character, and I am not sure that it will stimulate callous formation or hold it better than a plate and screw nails. Judging from my own experience and those who have used the method, the application of the plate and screw nail is undoubtedly the very best way of fixing a bone by the open method and, when carried out absolutely aseptically, will give probably the best results. I have not used the band personally but I know that when we have used the wire, which is practically the same principle, there has always been the danger of its loosening and letting the fractured ends of the bone free. I wish to say a word, however, about the great value of the open method of treatment and the use of any mechanical means to hold the bone in position, more particularly in fracture of both bones of the forearm at the junction of the middle and lower thirds, in which it is impossible to get perfect anatomical alignment. We had quite a number of these cases, particularly in girls. The plan which we adopted was to make an incision on each side, put the bone in position accurately by the open method, then close the wound up, put in plaster of paris, and after two weeks take out the stitches, begin passive motion, movement and massage, and perfect results were thus obtained without bending or bowing. Another method of fixation, more particularly in fractures of the joints, the elbow, the end of the humerus and also fractures through the upper end of the ulna, is by the use of Lamboth's needle, curved so as to suit the particular case. It can be buried for several weeks and at the end of the fourth or fifth week a small incision is made in the scar, the needle carefully loosened and withdrawn; anatomically it gives very satisfactory results. In treating by the open method one must be extremely careful to note the general condition of the patient. I have had in my experience untoward results; in one case where I exercised the greatest care in carrying out the technique, a patient, who had fractured his femur, a big powerful man with an oblique wound with a long slant and a great deal of displacement and overriding, within forty-eight hours after the reduction developed an acute streptococcus infection and died; he had been suffering from a tonsillitis. I do not think we get good extension by Buck's method, particularly in oblique fractures; there is the difficulty of overcoming muscular contraction. In bones broken in three portions I have been able to get a very presentable bone with Hay's modification of two Steinman's needles, by introducing two spreaders between and encasing the limb in light bandages.

2. The second paper was given by Dr. J. Appleton Nutter on "Some Common foot conditions and their treatment". (Published in this issue.)

Discussion: Dr. M. Lauterman: I would like to ask to what extent Dr. Nutter thinks gonorrhœal rheumatism is a cause of the conditions described to-night. A great many of the cases are claimed to have had infections and I wonder to what extent gonorrhœa contributes to any of these conditions.

Dr. F. R. England: I would like to know what treatment is carried out where there is a well established rigid foot, and tendency to flat foot with rigidity.

Dr. A. E. Garrow: The best attribute to this paper to-night is that there is no criticism of it. I would only endorse through a very great authority the treatment of these very bad cases of specific pronation. I saw Jones of Liverpool treat a number of these cases on one afternoon. I would like to ask Dr. Nutter's opinion of Morton's metatarsalgia. It is a most excruciatingly painful thing, the toe seems to be held midway between dorsal and plantar flexion. I have found great relief by putting on a thick pad of felt and wearing it for a few days.

Dr. J. Appleton Nutter: As to gonorrhœal arthritis in the foot, this is often the cause of severe deformity. A pronated foot seems to be the favourite result of this infection and at times it may produce a claw-foot or leave the whole foot rigid.

As to the treatment of a rigid flat foot our results have been very satisfactory. We lay great stress on resection of the peroneal tendons followed by plaster of paris in over-correction for six weeks with a brace for a few months longer.

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